

**INFLUENCING CONSUMER PERCEPTIONS OF A SOCIAL ISSUE:
AN EXPERIMENT ON THE EFFECTS OF CREDIBILITY OF
THE SOURCE, MESSAGE SIDEDNESS AND INWARD/OUTWARD FOCUS
ON CONSUMER ATTITUDES TOWARD GENETICALLY MODIFIED FOODS.**

A thesis submitted in partial fulfillment

of the requirements for the Degree of

Doctor of Philosophy in Marketing

At the

University of Canterbury

By

M.S. Renton

University of Canterbury

2008

Abstract of a thesis submitted in partial fulfillment of the
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This thesis aims to increase understanding of New Zealand consumer reactions to messages promoting genetically modified food products (GMFs) and to determine how the manipulation of three persuasion variables, *message sidedness*, *source credibility* and *inward vs. outward focus* impact upon consumer attitudes. To achieve this aim, the study integrated two frameworks, Bredahl's, (2001) determinants of attitudes towards GMFs and Wansink and Kim's, (2001) strategies for educating consumers about GMFs, into a new model.

To empirically examine the model, a web-based experiment using a 2x2x2 between-subjects factorial design was conducted. The experiment exposed participants to one of eight treatment groups containing a promotional message for Genetically Modified foods. The participants then completed an on-line questionnaire detailing their responses to the messages. A total of 380 useable questionnaires were collected from a national sample of

consumers and analysed using ANCOVA. The results of the study suggest that the outwardly focused, two-sided message was more powerful at lowering perceptions of risks, raising perceptions of benefits and positively influencing attitudes toward the ad than either the one-sided, outwardly focused message, or the inwardly focused messages of either sidedness condition. For purchase intentions individual differences appeared to be of greater influence than message factors.

Keywords

Genetically Modified Food products, GMFs, consumer behaviour, experimental research, message effects, persuasion effects, advertising appeals, message sidedness, inward vs. outward focus, self – other orientation, source credibility, risk perceptions, benefit perceptions, attitude towards the advertisement and purchase intention.

ACKNOWLEDGEMENTS

This thesis would never have reached completion without the help and support of many people. Firstly, I would like to thank my supervisor Dr David Fortin and associate supervisor Dr Kevin Voges for their continual support, encouragement and guidance throughout the PhD process. Secondly, many thanks to my room mate Dr Chadinee Manesoonthorn, for help with the website. Other people in the Management Department at Canterbury University deserve special thanks, particularly Dr Robert Hamilton for his support and advice throughout many of his lunch breaks. I'd also like to pay special thanks to the two Irene's, Edgar and Joseph for their assistance throughout my time at Canterbury and to the staff at the Scholarships office. Most importantly, special thanks and much love to my husband Andrew, for his many comments, red-pen marks and constructive criticism, but mostly for his love, support and for simply being there. Finally, the thesis is dedicated to my father, Robert Anderson, who wasn't here to see the finish line, but who knows anyway.

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Chapter One

Thesis Overview

1.1 Introduction

The commercial use of modern biotechnology, Genetic Modification (GM) or Genetic Engineering (GE) in food production is relatively new, with the first cultivation of crops occurring in the early 1990's (Pretty, 2001). By the year 2001, estimates were that 52.6 million hectares of GM crops were grown in over 13 countries, with animal based biotechnologies continuing to be developed. However, many researchers working in the food technology field have found that consumers remain uneasy with GM foods and studies have repeatedly shown that purchase intentions remain low in many countries. This consumer unease is identified as a trend that threatens the crucial long-term acceptance and continued development of modern biotechnology processes, as well as the multi-billion dollar food biotechnology industry itself. (Bredahl, 1999; Frewer, Howard & Aaron, 1998; Frewer, Howard & Shepherd, 1995). While researchers have investigated consumer perceptions of genetically modified foods (GMFs), very few empirical studies have examined the effects of information dissemination on public attitudes. It also appears that the investigation of how advertising appeals affect consumer attitudes towards GMFs or intentions to purchase such products has been

overlooked by the current literature in the area. The proposed study hopes to fill this gap by examining the persuasion effects of specific advertising appeals supporting consumption of GMFs within a New Zealand context.

1.2 Background to the Study

The aim of this study is to examine how advertising appeals affect consumer attitudes and purchase intentions towards GM foods. To achieve this aim, the study takes a cognitive approach, measuring the differences in cognitive responses to advertising appeals. The study also integrates two frameworks sourced from the literature to develop a model for testing. These frameworks are Bredahl's (2001) determinants of consumer attitudes towards GM foods and Wansink and Kim's (2001) proposed strategies for educating consumers about GE foods.

In consumer behaviour terms, the purchase and consumption of supermarket food products is generally thought of as a low involvement, routine activity for consumers. The advent of GMFs has altered consumer perceptions however, so that foodstuffs produced with these technologies are viewed differently from traditionally grown products. This is in part due to the activities of the mass media, whose wide reporting of opposition to these types of foods has helped fuel awareness of and concern about the new technologies. A sizeable amount of exploratory work has been devoted to understanding how consumers perceive GMFs and results suggest that while there is no worldwide consensus of opinion, a number of general comments can be made. Firstly,

research has confirmed that in many cultures, consumer concerns remain entrenched to the present time. Macer (2003) reports results from the international bioethics survey, which suggests that in all countries, support for biotechnology and genetic engineering has dropped while at the same time GM crops have become standard varieties in the US and China. Secondly, acceptance of GMFs appears lowest throughout Europe, in some parts of Asia such as Japan and Singapore, and in New Zealand. In countries such as Australia, the Americas, India and Thailand, consumer opposition to GMFs doesn't appear to be as strong (Business and Economic Research Ltd, 2003; Macer, 2003; Wansink & Kim, 2001).

Additional findings suggest that public support for genetic engineering for medical purposes is higher than for applications to food (Small, Wilson, Pederson & Parminter, 2002) and although the public express concerns regarding abstract questions about genetic engineering, less concern tends to be shown for specific applications (Frewer, Howard & Aaron, 1998; Hallman & Metcalfe, 1993; Kelley, 1994; Macer, 1992). Furthermore, it would appear that consumers' acceptance levels vary depending on the type of organism that is manipulated, with microbial and plant based applications viewed more positively than those manipulating animal or human DNA (Frewer, Hedderley, Howard & Shepherd, 1997; Macer 2003). Identifiable demographic factors have also been sought to determine whether any social variables influence approval. Increased approval has been associated with being male (Cook, 2000; Small et al., 2002), being male, of higher education and of a young age, (Frewer, Miles & Marsh, 2002; Magnusson & Hursti, 2002) and with being male, highly educated, young and Hindi (Subrahnamyan

& Cheng, 2000). Other studies however, have found no effect for differences in age (Cook, 2000), education (Verdume & Viaene, 2003), or religious affiliation (Kelley, 1994).

Along with the general findings discussed above, research questions have moved to examining the level of acceptance and resistance to GMFs in specific countries and investigating consumer perceptions of needs, risks and benefits associated with GMFs. Researchers have used established consumer behaviour models such as the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980), the Theory of Planned Behaviour (TPB) (Ajzen, 1985; Azjen, 1991) and the Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1986) to help explain consumer attitude formation, change and purchase intentions. Many, for example Bredahl (2001); Gamble, Muggleston, Hedderley, Parminter and Richardson-Harman (2000), and Saba and Vasallo (2002), have found that consumers recognize salient benefits in GMFs, but purchase intentions remain low, in part because the perceived risks associated with the foods outweigh the potential benefits offered. A full discussion of these research findings is the subject of the literature review contained in section one of chapter two.

In New Zealand, previous research has given us an understanding of how consumers view GMFs, (see for example, Cook, 2000; Gamble et al. 2000; Gamble & Gunson 2002; Renton & Fortin, 2003). In the main, this research suggests that while consumers may recognize salient benefits, the risk factors associated with these foods predominate and overall purchase intentions remain low. This study proposes to extend this work in two

ways. Firstly by exploring in greater depth New Zealand consumer attitudes towards GMFs and secondly, by examining how three specific persuasion manipulations: one and two-sided messages, inward vs. outward focus, and source credibility, impact upon cognitive elaborations of an advertising appeal, perceptions of risks and benefits associated with the foods, attitudes towards the source, attitude towards the appeal, and purchase intentions.

1.3 Research Aims

Based on the foregoing discussion, this study has three main research objectives;

1. To gain further understanding of New Zealand consumer reactions to genetically modified food products in general.
2. To investigate the product benefits that consumers desire from individual GM foods and identify specific risks of concern to them.
3. To determine how the manipulation of three persuasion variables, *message sidedness*, *source credibility* and *inward vs. outward focus* impacts upon consumer attitudes towards GM foods, and to test different combinations of the variables to determine which will have the greatest persuasion effects for consumers.

1.4 Thesis Outline

The thesis is divided into seven chapters as follows;

- Chapter one provides an overview of the context of the study and details the research aims.
- Chapter two presents the literature review for this study. It is divided into four sections, the first section reviews literature relevant to the context of this study, consumer perceptions of GMFs. The remaining three sections detail the literature associated with the independent variables manipulated in the experimental study. These are message sidedness, inward vs. outward message focus and source credibility.
- Chapter three presents the aims, methodologies and results of the exploratory research work conducted in focus groups during June 2003. These address research questions one and two.
- Chapter four presents the theoretical framework underpinning the experimental research part of this study, reviews the literature relevant to the component parts of the model and details the hypotheses to be tested.

- Chapter five presents the research methodologies used in this study, including the development of the on-line study, the questionnaire, the selection of the sample and the procedures used to collect the data in February and March 2005.
- Chapter six presents the statistical analyses of the data collected, and addresses research aim three.
- Chapter seven discusses the major findings, the practical implications of these and the limitations of this research. Future directions for research will also be discussed.

Chapter Two

Literature Review

2.1 Chapter Introduction

The purpose of chapter two is to present a review of the literature associated with this study. The chapter is divided into four sections, with section two covering the previous work in consumer perceptions about GMFs. It begins with a general literature discussion, looks at consumer perceptions of ethical considerations, benefits and risks associated with GMFs and reviews studies explaining attitude formation, attitude change and purchase intentions. Sections three, four and five each review research related to the independent variables chosen for inclusion in the experiment. These are message sidedness, inward vs. outward message focus, and source credibility and each was included because of specific persuasion effects previously found. The sections follow similar formats, introducing early work and detailing the theoretical development of the subject, examining information processing effects and concluding with a discussion of why the chosen variable has been included in this study.

2.2 Consumer Perceptions Regarding GMFs

2.2.1 Introduction

The purpose of this section is to provide a review of research work into consumer attitudes towards GMFs. It presents an overview of the research detailing consumer perceptions of these foods and moves from studies looking at ethical considerations to those which focus on consumer perceptions of benefits and risks, attitude formation, attitude change and purchase intentions.

2.2.2 General Literature Discussion

Even in countries where support for GMFs is evident, for example, Canada (Sheehy, Leggault & Ireland, 1998) and the USA (Falk & Chassy, 2002; Wansink & Kim, 2001), researchers have suggested that consumers view these products very differently from conventional food products. Provoking a sense of moral worry in some, GMFs may be perceived as providing additional product benefits, but they also appear highly risky, with unknown long-term outcomes. A number of theoretical approaches have been used to investigate consumer attitudes and purchase intentions towards GMFs. These include the use of constructs such as ethical concern and risk and benefit perception to measure the way in which these foods are considered, and studies investigating attitude formation, attitude change and purchase intention have used established models such as The Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB) and the Elaboration Likelihood Model (ELM). Other approaches include conjoint analysis, and work has also investigated the effects of information dissemination on consumer attitudes. Table 2.1 outlines the research in

chronological order and a discussion of each of the main areas follows, beginning with studies looking at ethical considerations.

2.2.2.1 Ethics

Moral and ethical considerations appear to have an influence on consumer thought processes towards GMFs. Frewer, Howard and Aaron (1998) cite studies in which Italian concerns regarding genetic modification appeared to focus more on ethical considerations than risk factors, and Bredahl's (1999) qualitative study found that Danish and German consumers both expressed moral reservations over GMFs. Subrahmanyan and Cheng's (2000) Singaporean survey found that 22% of respondents expressed ethical concerns about the technology and Small et al.'s (2000) New Zealand study found that the consumption of GMFs was contrary to most respondents spiritual or cultural beliefs. In attitude formation research, Sparks, Shepherd and Frewer (1995), Bredahl et al. (1998), Gamble et al. (2000), Bredahl (2001) and Saba and Vasallo (2002) all report findings suggesting that ethical considerations influence consumers by acting on their general attitudes towards GMFs. In terms of influencing purchase intentions Sparks, Shepherd and Frewer (1995) found ethical considerations to be only a marginally significant contributor to behavioural intention, while Bredahl (1999), Gamble et al. (2000) and Saba and Vasallo (2002) found ethical considerations to be non-significant influences. Previous results would suggest therefore that ethical considerations play a role in forming general attitudes but are limited in influencing purchase intentions.

Table 2.1 Literature reviewing consumer perceptions of GMFs

<i>Citation</i>	<i>Aims of Research</i>	<i>Research Methodology</i>	<i>Major Findings</i>
Sparks, Shepherd & Frewer (1995).	Applies the TPB to the formation of attitudes towards GMFs and investigates the role of ethical obligation.	Survey. Country; United Kingdom.	Perceived behavioural concern, self-identity and concern about environmental issues provide independent contributions to expectations about eating GMFs. Perceived ethical obligations were only a marginally significant predictor of behavioural expectations.
Frewer, Howard & Shepherd (1996).	Examines the influence of product exposure on consumer perceptions of GE food.	Experimental. Country; United Kingdom.	Realistic product exposure did not influence consumer attitudes towards GE. Acceptability was dependent on tangible benefits associated with specific products, health and environmental benefits more acceptable than decreased cost and increased shelf life. Likelihood of purchase may be linked to perceived naturalness of the product.
Frewer, Howard, Hedderley & Shepherd (1996).	Identifies the underlying determinants of trust in information sources about food related hazards.	Semi structured interviews and Survey. Country; United Kingdom.	The most important and frequently cited sources of information are the print and television media. Scientists, medical sources, radio and consumer organisations were all named as trusted but unimportant sources. Distrusted sources are associated with a history of providing inaccurate information and deliberate distortion of information. Increased trust linked to moderate degrees of accountability. Government sources are not trusted, while industry information may be moderately trusted when it is provided out of concern for public welfare, and balances long vs. short term interests.

<i>Citation</i>	<i>Aims of Research</i>	<i>Research Methodology</i>	<i>Major Findings</i>
Frewer, Hedderley, Howard & Shepherd (1997).	Compares personal objections to either general or specific applications of Genetic Engineering.	Survey. Country; United Kingdom.	Most respondents objected less to applications involving plants and micro-organisms than to applications involving animal or human DNA. The likelihood of rejection/acceptance is dependent on communication regarding specific tangible results. Women and those high in environmental concern have the greatest objection to applications using animal and human DNA.
Frewer, Howard & Shepherd (1997).	Investigates the underlying psychological constructs shaping public views of GE.	Survey. Country; United Kingdom.	Different applications of genetic engineering are closely linked to perceptions of risk, benefit or need as defined by the nature of each application. Ethical considerations are also important.
Bredahl, Grunert & Frewer (1998).	Provides a theoretical basis from which to study consumer attitudes towards GM foods.	Conceptual.	Three models were developed. Model one, to test attitude formation is based on Fishbein's multi-attribute attitude model. Model two, to test purchase intention is based on Ajzen's theory of planned behaviour. Model three to test attitude change, uses Petty & Cacioppo's ELM and Social judgement theory.
Frewer, Howard & Aaron (1998).	Literature Review of previous studies.	Conceptual.	General applications of GM technologies are seen as either positive or negative. Specific applications are more highly differentiated in perceptual terms and negative perceptions may be mediated by need or benefit. Consumer benefits are a more important consideration than process considerations. Labelling engenders a sense of trust
Sheehy, Legault & Ireland (1998).	Combines and summarises early focus group and survey work on consumer opinions regarding GMF's.	Conceptual. Country; Canada.	Consumers are more accepting of products that respond to broad societal needs, including environmental economic, safety and ethical considerations. Many consumers have a preference for relying on others to ensure GE foods are safe, some wish to make their own decisions based on information provided. Government and universities are good sources for information, the private sector is often distrusted.

<i>Citation</i>	<i>Aims of Research</i>	<i>Research Methodology</i>	<i>Major Findings</i>
Wohl (1998).	Discusses previous research findings.	Conceptual. Country; Canada.	Most trustworthy sources of information about food safety are health professionals, university scientists, consumer associations and family and friends. Groups with least credibility on biotechnology issues are religious leaders, corporations, industry associations and the government.
Frewer, Howard, Hedderley & Shepherd (1999).	Uses the ELM to investigate the impact of trust in source, and perceived personal relevance, on attitudes towards GMFs.	Factorial experiment. Country; United Kingdom.	Manipulates level of personal risk (h/l), trust in source (h/l), and persuasive informational content (h/l)). Respondents became more negative when the social context of the information provided negative cues rather than more positive when it provided positive cues. Perceived personal relevance was not as influential in terms of elaborative processing as the ELM would predict. Trust in the information source was an important determinant of how people respond to GE.
Bredahl (1999).	Aims to gain insight into consumer attitudes towards GMFs.	In depth interviews Country; Denmark, Germany, United Kingdom, Italy.	In all four countries preference for the GM products was low, more so in Denmark and Germany than the UK and Italy. Associations focus on perceived risks with benefits unable to overcome negative consequences. Risks and benefits are considered in light of perceived consequences for selves, others (family and future generations) and the environment. Applying GM to yoghurt and beer was associated with unnaturalness, unwholesomeness, and low trustworthiness. For beer, GM was perceived as morally wrong and superfluous, giving rise to low product quality.
Bech-Larsen & Grunert (2000).	Investigates consumer preferences for GM and conventional cheese.	Conjoint analysis Country; Denmark, Norway, Switzerland, Finland.	Rejection of GM food persistent, not even substantial product benefits could overcome it. Consumers' general rejection of GM foods modified by tasting experience when accompanied by a health benefit, but conventionally produced product still preferred..

<i>Citation</i>	<i>Aims of Research</i>	<i>Research Methodology</i>	<i>Major Findings</i>
Cook (2000).	Investigates the personal motivations that determine purchase intentions of GMFs.	Focus groups and survey. Country; New Zealand.	Self identity, attitude, subjective norm and perceived behavioural control have both combined and independent significance in determining intentions to purchase GMFs.
Subrahnamyan & Cheng (2000).	Examines perceptions and attitudes of Singaporean residents towards GE.	Survey. Country; Singapore .	Over half of the respondents expressed some concerns towards GMFs. Issues related to health, ethics and lack of perceived benefits. Women more concerned about ethical difficulties than men. Concerns decrease with higher education levels, for consumers who are married and those with children under 15 years of age. Hindus were less concerned if sufficient benefits were shown.
Rosati & Saba (2000).	Quantifies some influential factors regarding the acceptance of food biotechnology.	Survey. Country; Nthn Italy.	Most respondents believe GMFs provide high risk, low benefit and high uncertainty to human health, the environment and future generations. Perceptions of risk, benefit, uncertainty, moral issues and trust contribute to evaluating the acceptance of GMFs. Most trustworthy sources of information are consumer associations, environmental associations and scientific organisations, while producers are the least trustworthy.
Gamble, Mugglestone, Hedderley, Parminter & Richardson-Harman (2000).	Investigates public perceptions of transgenics applications.	Focus group, conjoint analysis and survey research. Country; New Zealand	<i>Focus Groups</i> –Concerns relate to effects on short and long term health and environmental impacts. Big businesses perceived to have a monopoly over information dissemination, policy and regulation formation. <i>Conjoint analysis</i> – consumers can be clustered into segments surrounding price (2 segments) and non-GM make up (2 segments). <i>Survey</i> – Most consumers negative toward GM foods. Benefit perceptions drive acceptance, while increased risk perceptions leads to greater rejection of the technologies. Attitudes more positive toward specific products offering a benefit than general products.

<i>Citation</i>	<i>Aims of Research</i>	<i>Research Methodology</i>	<i>Major Findings</i>
Harsant & Kalafatelis (2001).	Measures changes in awareness of knowledge regarding GM.	Survey. Country; New Zealand.	4% of respondents identified GM as an issue of importance to New Zealand's future. The media, including television, newspapers, radio and magazines was the most important source of information regarding GMF.
Bredahl (2001).	Investigates the formation of consumer attitudes towards GMFs and purchase decisions for GM beer and yoghurt.	Cross national survey. Country; Denmark, Germany, United Kingdom, Italy.	Results suggest European consumers have strong, sceptical beliefs about GMFs and low purchase intentions. Attitude to GMFs is a function of the perceived risks and benefits of a product, with welfare benefits having the highest direct impact and perceived risks determining how product benefits are perceived. Attitude toward purchasing the product is the only significant determinant of purchase intentions. Attitudes towards purchasing the product are explained by product specific beliefs, influenced by overall attitude towards GM in food production.
Grunert, Lahteenmaki, Nielson, Poulsen, Ueland & Astrom (2001).	Aims to investigate the affects on consumer perceptions of three GM food products modified in different ways along the distance dimension.	Interviews. Country; Denmark, Finland, Switzerland and Norway.	For all GM products, benefits were perceived, but benefits outweighed by risk factors. For cheese, the distance dimension had a clear impact on ranking of food choices. For candy, functional benefits were perceived, but over compensated for by risk perceptions. For salmon, risks and negatives outweighed the benefits, e.g. faster growth (a benefit) actually perceived as a risk factor (harm to the environment).
Miles and Frewer (2001).	Investigates public perception of food hazards including GM foods	Semi-Structured interviews Country; United Kingdom	Health concerns associated with long term effects, unknown side effects, and effects on future generations. Participants perceived GMFs to be interfering with nature, and associated with negative impacts on the environment and animal welfare. Other concerns included a lack of consumer control. Three perceived benefits of GM technologies identified including cheaper food, less wastage and greater longevity.

<i>Citation</i>	<i>Aims of Research</i>	<i>Research Methodology</i>	<i>Major Findings</i>
Baker & Burnham (2001).	Investigates whether different market segments for GMFs exist.	Conjoint analysis Country; USA.	Market segments identified based on preferences for brand, price and GMO content. Those with low risk aversion scores most likely to believe that GMO's improved the quality or safety of food. Acceptance increased with knowledge about biotechnology.
Wansink & Kim (2001).	Outlays what authors consider to be false assumptions about consumer perceptions regarding GM foods.	Conceptual. Country; USA.	In the US, food safety is generally entrusted to regulatory organisations, in which trust appears high. Many US consumers believe decisions about food safety should be left to experts, but there are also information seekers who wish to make their own informed decisions regarding GMFs. Authors believe that salient benefits may come to outweigh risks and that negative attitudes may not lead to negative purchase intentions. The authors present education strategies based on consumer attitude profiles.
Noussair, Robin & Ruffieux (2002).	Investigates the willingness of consumers to pay for GMF's.	Vickrey auction. Country; France.	When consumers became aware that a chocolate bar contained GMOs, there was an average decrease in offer prices of 30% in an auction setting. Almost 80% of subjects were willing to buy the product at some positive price, indicating that the market does moderate opposition to GMO's.
Burton & Pearce (2003).	Tests whether including consumer benefits of GM products will improve acceptance of beer.	Choice modelling. Country; Australia.	30% of subjects were not prepared to select a beer with any GM component for any price or health advantage offered. A group of respondents required a price discount to accept beer with some level of GM application in its production, and a third segment was prepared to pay a premium to access a GM beer product with medicinal benefits.
Frewer, Miles and Marsh (2002).	Discusses social amplification of risk in the context of GM foods.	Survey. Country; United Kingdom.	People's risk perceptions increased and decreased in line with media reporting of risks associated with GMFs. Perceptions of benefits have remained low and trust in regulators was not affected by media amplification of risks.

<i>Citation</i>	<i>Aims of Research</i>	<i>Research Methodology</i>	<i>Major Findings</i>
Gamble & Gunson (2002).	Observes the impact of altering the level of intervention and benefits offered in specific GM products.	National Survey. Country; New Zealand.	Nearly 2/3's of respondents accepted within species transgenics for an apple when improved flavour resulted. Milk from a cow modified with human genes was acceptable to 60% of respondents, when it produced insulin for diabetics. Respondents with a good knowledge of biotechnology gave higher acceptability rating on all GM products
Saba & Vasallo (2002).	Assesses how attitudes influence the expectation of eating GM tomatoes using the TRA/TPB.	National Survey. Country; Italy	Most subjects held negative attitudes towards eating GM tomatoes. A strong predictive link between beliefs and attitudes, and between perceived behavioural control and intention of eating GM tomatoes existed. Perceived moral obligation was not significant.
Magnusson & Hursti, (2002).	Aims to further understanding of Swedish consumer perceptions of GM foods.	Survey. Country; Sweden.	Most consumers negative about GM foods. Males, younger, and more educated consumers were more positive. The majority of consumers had moral and ethical doubts and did not perceive better taste or lower price beneficial enough to affect purchase intentions, although environmental and health benefits did increase willingness.
Falk & Chassy (2002).	Summarises advances in biotechnology.	Conceptual. Country; USA.	Most American consumers appear unaware of the extent to which GM crops have entered the marketplace and most appear to trust the food supply. Safety of eating foods derived from biotechnology does not appear to be on most people's mind. Trust in the AMA and FDA outweighs that of activist groups.
Small, Wilson, Pederson & Parminter (2002).	Aims to examine New Zealanders support for GE food and medicine.	Survey. Country; New Zealand.	More people are totally opposed to GE than supportive, while a large middle group support it in some circumstances. Many do not believe GE foods have benefits, or that environmental effects are benign, with women more sceptical than men. GE did not fit well with cultural or spiritual beliefs. Acceptance decreases if GE involved harm to animals or people.

<i>Citation</i>	<i>Aims of Research</i>	<i>Research Methodology</i>	<i>Major Findings</i>
Renton & Fortin (2003).	Examines the impact of additional product attributes on consumer attitudes towards GMFs.	Experimental. Country; New Zealand.	Consumer attitudes towards GMFs are largely negative and, the presence of an additional product benefit in the form of additional longevity was insufficient to overcome such resistance.
Macer, (2003).	Summarises the international bioethics survey results 1993-2000.	Survey. Country; Multinational	More support given for specific applications perceived to be for a worthy goal than for general applications. Support for biotechnology and GE has declined, although from 1993-2000 groups supporting, rejecting and holding the middle ground are seen in all countries. Plant to plant GM most acceptable followed by animal to animal. Animal to plant and anything involving human genes, least acceptable.
Teisl, Halverson, O'Brien, Roe, Ross and Vayda (2002).	Gauges consumer reactions to alternative GM food labelling policies.	Focus Groups. Country; USA.	Authors found low levels of awareness in the six focus groups about GE foods. Also found negative reactions to GMO free claims, and a large amount of scepticism surrounding these claims.
Frewer, Scholderer and Bredahl (2003).	Tests the effects of trust on people's attitudes towards GMFs.	Experimental. Country; Denmark, Germany, Italy, United Kingdom.	Information provision appeared to have little effect on attitudes towards GMFs. Trust in the information source appeared to be predominately determined by prior attitude to GM foods and providing balanced information (containing both benefits and risks) had little impact.
Verdurme and Viaene (2003).	Explore consumer beliefs, attitudes and purchase intentions with regard to GM foods.	Focus groups and interviews. Country; Belgium.	Younger participants more positive about GMFs. Risks perceived for human health, the environment and the third world. Absence of tangible consumer benefits and lack of correct information by media and lobby groups create negative attitudes. Insufficient or incorrect information lowers trust and enhances risk perceptions, not compensated for by benefits. GM applied to premium brand preferred to GM applied to generic products.

2.2.2.2 Benefits and Needs

Table 2.2 Consumer perceptions of benefits offered by GMFs.

Benefit	Author
Price Advantage.	Frewer, Howard & Shepherd (1996), (<i>Within subjects experiment</i>) Gamble et al. (2000) (<i>conjoint analysis</i>), Baker & Burnham (2001) (<i>conjoint analysis</i>) Burton & Pearse (2003) (<i>choice modelling</i>) Miles & Frewer (2001) (<i>interviews</i>) Grunert et al. (2001).(<i>interviews</i>) Noussair, Robin & Ruffieux (2002) (<i>Vickrey auction</i>) <i>Not supported</i> ; Bech-Larsen & Grunert (2000) Bredahl (1999) & Magnusson & Hursti (2002)
Environmental benefits.	Frewer Howard & Shepherd. (1996), Bredahl, (1999) (<i>interviews</i>) Bredahl (2001), (<i>survey</i>) Grunert et al. (2001) Magnusson & Hursti (2002) (<i>focus groups</i>)
Improved taste.	Bech-Larsen & Grunert (2000) Grunert et al. (2001) <i>Not supported</i> - Magnusson & Hursti, (2002)
Less wastage.	Miles and Frewer 2001
Increased nutrition/ General healthiness.	Frewer, Howard & Shepherd (1996) Bredahl (1999) & Bredahl (2001) Gamble et al. (2000) Grunert et al. (2001)
Increased choice.	Gamble et al. (2000) Magnusson & Hursti (2002)
Improved future standard of living.	Bredahl (2001), Gamble et al. (2000)

Many studies have shown that with salient benefits being offered opposition towards GMFs can be moderated. Table 2.2 outlines specific product benefits tested and found to positively influence attitudes towards GMF's.

The benefit of most influence in affecting consumer perceptions is price advantage. Conjoint analyses conducted by Baker and Burnham (2001), Gamble et al. (2000),

and Burton and Pearse's (2003) choice modelling studies, all identified consumer segments preferring the GM products offering a price advantage. A similar result was found in Noussair, Robin and Ruffieux's (2002) auction in which almost 80% of subjects were willing to buy a GM chocolate bar at a heavily discounted price. Other positive features of influence include increased health benefits, while environmental benefits, less wastage, improved flavour, improved future standard of living and increased product choice were also recognised. Factors tested and not perceived by consumers as beneficial include increased shelf life (Frewer, Howard & Shepherd, 1995; Renton & Fortin, 2003), a sensory benefit in the form of softer creamier filling in candy, and faster growing salmon (both in Grunert et al., 2001). For increased longevity, the Renton and Fortin study (2003) found there was a lack of perceived need for the benefit and an association with unnaturalness, in the case of the soft creamy candy, the benefit was seen as trivial and therefore insufficient to overturn resistance, and the faster growing salmon was actually seen as harming nature and therefore was perceived as a risk rather than benefit (Grunert et al., 2001).

Ongoing research has found that the positive influence of additional product benefits does not always extend to increasingly positive attitudes towards a product or purchase intentions. In Bredahl's (2001) study sceptical attitudes towards GMFs remained regardless of the health, environmental or price benefits offered, while Bredahl (2001), Gamble et al. (2000) and Saba and Vasallo, (2001), have all found that while consumers recognise salient benefits, purchase intentions remain low because the perceived risks associated with the foods have a greater influence than the potential benefits offered. These studies suggest that consumers weigh the value of additional product benefits against the risks they perceive in GMFs.

2.2.2.3 Risk Perceptions

Table 2.3: Consumer perceptions of risks posed by GMFs

<i>Risk</i>	<i>Author</i>
Uncertainty to human health.	Bredahl (1999) Rosati & Saba (2000) Gamble et al. (2000) Miles and Frewer (2001) Bredahl (2001) Grunert et al. (2001) Saba & Vasallo (2002)
Harm to the environment.	Bredahl (1999) Rosati & Saba (2000) Gamble et al. (2000) Miles and Frewer (2001) Bredahl (2001) Grunert et al. (2001) Saba & Vasallo (2002)
Carries a societal risk of unknown long term consequences.	Bredahl, (1999) Rosati & Saba (2000) Gamble et al. (2000) Miles and Frewer (2001)
Risk to animal welfare.	Miles and Frewer (2001)
Lack of consumer control.	Miles and Frewer (2001)
Unnatural.	Bredahl (1999) Gamble et al. (2000) Bredahl (2001)

Table 2.3 outlines the studies investigating consumer perceptions of the risks posed by GMFs. Risks most commonly associated with the foods are those related to human health, the environment and those that endanger others both in the short and long term. Other risks include animal welfare, lack of consumer control and the perception that food is becoming increasingly unnatural. Some researchers have found that risk perceptions outweigh all other considerations and are a key reason for ongoing resistance and low purchase intentions. In Bredahl's (1999) interviews, associations with GMFs focused more on risks than benefits. In Bredahl's later (2001) survey perceived risks were crucial in determining how benefits were

regarded. Gamble et al.'s (2000) study showed that increased risk perceptions led to greater rejection of the technologies and to low purchase intentions regardless of product attributes offered. Bredahl, Grunet and Frewer (1998) included the role of risk perceptions in a model conceptualised to explain attitude formation, subsequently testing it in survey research. The model and results of studies using it are discussed next.

2.2.2.4 Attitude Formation Models

Bredahl et al.'s (1998) model appears the most significant attempt at theorising the elements that contribute to consumer attitude formation in this context. Using Fishbein's (1963) hypothesis that attitudes are a function of beliefs about an object multiplied by the strength of those beliefs, the model was tested in 1999 in a cross-national survey in Denmark, Germany, the United Kingdom and Italy. Figure 2.1 displays the revised model based on results for the Danish, German and British data, suggesting that general attitudes, including attitude towards technology, attitude to nature, food neophobia (a fear or dislike of new, novel or unfamiliar foods), alienation from the market place and perceived knowledge all inform consumer perceptions of the risks, while attitude to technology informs perceptions of benefits. Risk and benefit perceptions combine to create an overall attitude towards the use of genetic modification in food production. The results go on to suggest that attitudes remain largely negative because consumers use perceptions of risk to evaluate the worth of benefits and often these risks overwhelm the potential benefits offered. In New Zealand, Gamble et al. (2000), using Bredahl's revised model, also found that the largely negative attitudes towards GMFs could best be explained by a risk-benefit analysis. The authors suggest that the construct attitude to nature had the strongest influence on both perceptions of risks and benefits, while food neophobia and

marketplace alienation played a role in determining perceived benefits but not perceived risks.

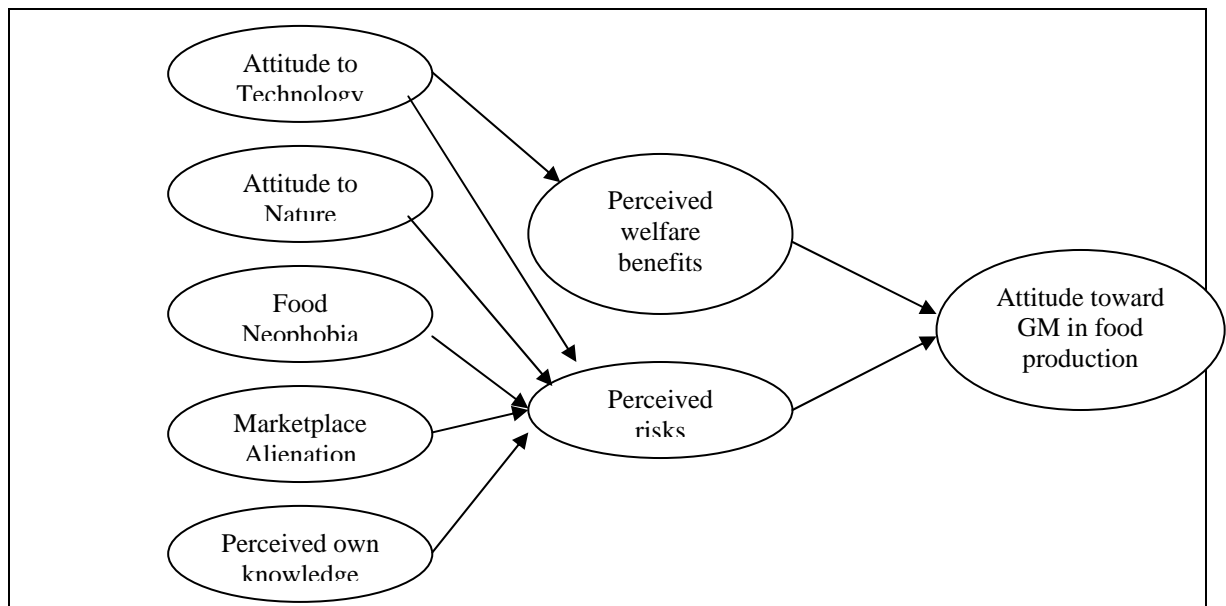


Figure 2.1: Bredahl's (2001) revised attitude formation model, based on Danish, German and British data.

2.2.2.5 Purchase Intention Models

Ajzen and Fishbein's (1980) Theory of Reasoned Action (TRA) and the later Theory of Planned Behaviour (TPB) have been used several times to test intentions to purchase and consume GMFs. In the TRA, it is suggested that volitional behaviour arises from behavioural intentions, a function of attitude toward performing a behaviour, and perceptions of subjective norms (social pressures) to perform that behaviour. In the TPB, Ajzen (1985) introduces the concept of perceived behavioural control as an additional influence.

In testing purchase intentions based on the TPB, Sparks, Shepherd and Frewer (1995) found a predictive link between attitudes towards GMFs and expectations of eating such food products. Perceived behavioural control and self-identity also contributed, while ethical obligations were only marginally significant. Bredahl (2001) found that attitude toward purchasing GMFs (a function of perceived quality and perceived

trustworthiness of the product) was the only significant determinant of purchase intentions. Gamble et al. (2000) explained purchase intention as influenced by general attitudes towards GMFs, the perceived difficulty of avoiding a GM product and subjective norms. Cook (2000) included a measure of self-identity in his model and found that attitudes, self-identity, subjective norms and perceived behavioural controls all had significance in determining purchase intentions. Finally, Saba and Vasallo (2002) used the theory of planned behaviour to help measure Italian intentions of consuming GM tomatoes. They found that while most consumers held negative attitudes, consumption intentions could be predicted by beliefs and attitudes as well as perceived behavioural control, while moral obligation and the attitudes of others were not significant.

In markets where purchase intentions remain low, finding ways of positively influencing consumers has both commercial and theoretical importance and is an area in which information dissemination and attitude change theories make a significant contribution. The work that has been carried out in this area is discussed next.

2.2.2.6 Information Dissemination

Sheehy, Legault and Ireland (1998) identify consumers as either institutionalists, those willing to rely on others to ensure food is safe, or information seekers, those who actively seek information to make their own informed choices. For institutionalists, regulators appear trustworthy, and both Wansink and Kim (2001) and Falk et al. (2002) suggest that the high level of trust US consumers have in regulators such as the American Medical Association (AMA) and Federal Drug Administration (FDA) may be part of the reason why opposition to GMFs is lower in North America

than it is in continental Europe or the United Kingdom, where previous food scares have lowered the levels of trust in food regulators.

In countries where opposition is high and consumers are information seekers, researchers are interested in how trust in the source helps in the effective dissemination of knowledge about GMFs. Frewer, Howard, Hedderley and Shepherd (1996) suggest that biased and self-serving messages are damaging while source characteristics such as knowledge, competence, accountability, truthfulness, accuracy and concern for public welfare enhance trust in both the source and message content. Their results indicate that television current affairs programmes and quality newspapers are among the most frequently cited and trustworthy sources of information, with university scientists, medical sources, radio and consumer organizations, less used but also amongst the most trusted. The most distrusted sources include the tabloid press and the government, including MP's and ministerial departments. In their 1999 study, they found trust in the information source to be an important determinant of message persuasiveness. Gamble et al's. (2000) focus groups indicate that participants view information sources with cynicism, distrusting both the government and industry groups in equal measure. Consumer groups appear the most trusted, with science and research organisations being moderately trusted. These results support those of Frewer, Howard, Hedderley & Shepherd (1996), although they somewhat contradict later survey results by Gamble and Gunson (2002) in which three government agencies all scored highly or moderately highly on both awareness and trust. In results contrary to these, Frewer, Scholderer and Bredahl (2003) measured the impact of source trust on the persuasiveness of message content,

finding that source trust was largely determined by prior attitudes to GM rather than by any innate characteristics of the source itself.

Beyond the element of trust in the source, message content is also important in creating effective information dissemination. Studies investigating how message content influences attitude change in this context have used Petty and Cacioppo's (1986) Elaboration Likelihood Model (ELM) as a theoretical basis.

The Elaboration Likelihood Model

The Elaboration Likelihood Model (ELM) suggests the existence of two routes to persuasion, the central and peripheral routes. These form a continuum along which a message recipient's information processing strategy lies, contingent upon their motivation and ability to process the information given in a message (Petty & Cacioppo, 1986; Petty & Wegener, 1998). Whichever of these routes is chosen is driven by the individual's motivation and/or ability to process the information contained within a message. Those individuals who have high motivation and ability are those involved in or knowledgeable about a given subject, and/or those with a high need for cognition, that is, they have an innate desire to think about the information presented. These recipients adopt the "central" route to persuasion, forming reasoned opinions through thinking about or elaborating extensively on the claims made in the message. Those individuals low in motivation or ability to process information form an opinion about the message claims through the "peripheral" route. Instead of engaging extensively in elaborations, peripheral route processors use simple cues, which assist them in forming or changing attitudes. The cues appear to influence persuasion in one of two ways. Firstly, they can lead a receiver to form either a positive or negative association with the object of communication, for

example an attractive endorser = an attractive product, or secondly the cue acts as a heuristic device allowing the subject to make inferences about the communicative object, for example, an expert source allows a message recipient to infer that a product will work (Hastak & Park, 1990). The ELM suggests that persuasion effects are greater and more durable when information is processed through the central route than when the peripheral route is used. While persuasion can occur through the use of peripheral cues and heuristics, the framework suggests these effects tend to be less stable over time.

The Elaboration Likelihood Studies

Contrary to patterns predicted by the ELM, Frewer, Howard, Hedderly and Shepherd's (1999) study found that subjects who exhibited greater thought processing after information intervention became more negative rather than positive in their attitudes, and they explain this in terms of the amplification of the social risk associated with GMFs. Frewer, Scholderer and Bredahl (2003) investigated the effects of changing message content on attitudes by using information from different expert opinions. They found that message content had little impact on attitude change and suggest that future research use product benefits and concerns of importance to everyday consumers, as they believe the expert opinions may have lacked relevance to the study's subjects.

While these studies were not successful in using message content to influence persuasion effects, a further framework developed by Wansink and Kim (2001) suggests different education strategies for central and peripheral route processors. They suggest that a two-sided message providing clear evaluation criteria and reliable statistics would have greater persuasiveness for central route processors, while for

those using the peripheral route, a one-sided message with expert endorsers and up to date information should increase persuasion effects. Finally, for those with no current attitude, focusing on basic information through publicity and advertising with visible and credible endorsers may be useful. No studies were sourced which tested this framework, and this study proposes to do so by integrating these strategies with Bredahl's (2001) determinants of attitude formation. Details of the model resulting from this integration are included in chapter four, the theoretical framework. Meanwhile, section 2.3 of this chapter continues the literature review by discussing message sidedness.

2.3 Message Sidedness

2.3.1 Introduction

Research into the use of one and two-sided messaging has a long history, beginning during World War two with the work of the Yale group (Hovland, Lumsdaine & Sheffield, 1949; Lumsdaine & Janis, 1953), whose initial studies compared the effectiveness of one and two- sided propaganda communications. Message sidedness effects have since been studied in such domains as communications research, political broadcasting and advertising. This section begins with a brief description of the early work in the communications literature and then focuses on message sidedness effects in advertising appeals, describing various theoretical foundations and discussing the results of empirical studies in light of those theories. It then continues by examining how the effectiveness of two-sided messages can be maximised using the message structuring variables outlined in Crowley and Hoyer's (1994) integrative framework, before concluding by discussing message sidedness in the context of this study.

2.3.2 Early Communications Research

The seminal work on message sidedness effects in communications, (Hovland, Lumsdaine & Sheffield, 1949), found that for message recipients who were highly educated, and/or whose opinions were contrary to those put forward in a message, increased persuasion could be induced by including counterarguments, that is, by making a message two-sided. For those with less education, or whose initial opinions already aligned with the views conveyed, a one-sided, fully supportive message containing no counter arguments was more persuasive. These results were replicated and extended several times throughout the 1950's and 1960's. For example,

Lumsdaine and Janis (1953) found two-sided messaging to be more effective over time when the audience was exposed to counter propaganda, or disagreed with the views stated in the message. Faison (1961) extended Hovland et al.'s (1949) results into an advertising context, finding two-sided messaging more effective with higher education levels and for those initially opposed to the position taken in the message. Inkso (1962) and Hass and Linder (1972) looked at ordering effects, Inkso finding that initial presentation of a two-sided message was more effective in inducing resistance to change than initial presentation of a one-sided message, and Hass and Linder (1972) suggesting that early presentation of negative information within a two-sided message was more effective than late presentation. Finally, McGinnies (1966) and Chu (1967) both extended message sidedness studies into a cross-cultural context. McGinnies using a Japanese sample found that for those opposed to a message, a two-sided approach was more effective when measured by attitude change, convincingness ratings and impressions of the speaker. Chu, using a group of Taiwanese students, tested whether the persuasive effects of a communication were an inverse function of bias. He found that two-sided messages were more successful for subjects familiar with the issues, suggesting this was because they could detect omissions and bias in a one-sided message. For students unfamiliar with the message topic, the one-sided message was more successful.

2.3.3 Theoretical Frameworks

Table 2.4 provides a chronological listing of studies dating from the early 1960's, when message sidedness effects were first investigated within the advertising and marketing research fields, until the latest studies sourced from 2003. To explain the findings contained in these studies, the authors have used a number of theoretical

frameworks (shown in table 2.5) which are briefly summarised below, with a more detailed discussion following the tables.

The early communications research work used the learning theories, such as the Yale chain of response model (Hovland, Janis & Kelly, 1953), and explanations for two-sided messaging effects were generated within this framework. Faison, (1961) using these learning theories expanded Hovland's results into an advertising context. In the early 1970's, Bither, Dolich and Nell, (1971), Sawyer (1973) and Szybillo & Heslin (1973) found two-sided refutational messages to be more effective at strengthening and reinforcing beliefs than one-sided messages and they used inoculation theories to explain these results.. While later researchers continued to find inoculation theories useful, see for example, Belch (1981), Etgar & Goodwin (1982), Kamins and Marks (1987) and Kamins & Assael (1987), by the mid 1970's others such as Golden & Alpert (1982), Settle & Golden (1974), Smith & Hunt (1974, Swinyard (1981) and Belch (1981) looked towards attribution and correspondence inference theories to explain effects on measures of believability and source credibility. Throughout the 1980's, 1990's and 2000's, both correspondence inference and inoculation theories continued to be used, with Kamins and Assael (1987) suggesting that they offer complementary rather than competing explanations of message sidedness effects.

However, once the cognitive elaboration models such as the ELM were introduced, the focus switched to measuring differences in levels of elaborative response to one vs. two sided messages, as well as the mediating effects of a range of covariates such as involvement, (Chebat and Picard, 1985 & 1987; Chebat, Filiatrault, Laroche & Watson, 1988, Hastak and Park, 1990), self acceptance, (Chebat & Picard, 1987) and

uncertainty orientation, (Sorrentino, Bobocel, Gitta, Hewitt & Olson, 1988). Other areas of research for two sided messaging have included cross cultural studies, (Tofolli, 1997), puffery, (Kamins & Marks, 1987) and celebrity endorsement (Kamins,1989 and Kamins, Brand, Hoeke & Moe,1989) Message effects such as the use of correlated attributes (Pechmann, 1992, Bohner, Einwiller, Erb & Siebler (2003) have also been examined. Recently, Crowley and Hoyer (1994) advanced optimal arousal theory in an attempt to take a more integrative approach to understanding message sided effects.

Table 2.4: Research into message sidedness effects

<i>Citation</i>	<i>Research Aims</i>	<i>Research Methodology</i>	<i>Major Findings.</i>
Faison (1961).	Extends Hovland's et al. (1949) results to an advertising context.	Experimental. products; range of consumer goods.	Confirms Hovland's results, the two-sided advertising appeals were more persuasive over a range of products for those of higher intelligence and those initially opposed. Effects did not diminish over time, although prior knowledge of the product diminished the influence of any appeal.
Bither, Dolich & Nell (1971).	Extends the application of inoculation theory outside the realm of cultural truisms.	Experimental. Issue; Movie censorship	Two-sided messages were more effective at strengthening and reinforcing beliefs outside cultural truisms.
Sawyer (1973).	Extends two-sided messaging research into an advertising context.	Experimental. Products; range of consumer goods.	Repetition of the refutational appeal did not lead to greater purchase intention than repetition of the supportive appeal.
Szybillo & Heslin (1973).	Applies inoculation theory to a marketing perspective.	Experimental. Products; air bags.	Inoculation theory was confirmed in a marketing context. All defences conferred resistance to attack arguments. The refutational defence was superior to the supportive defence.
Settle & Golden (1974).	Tests whether two-sided claims lead to higher product confidence.	Experimental. Products; range of consumer goods.	Believability of product claims and the credibility of the source increased when two-sided messages disclaiming superiority on an attribute were used.
Smith & Hunt (1978).	Investigates which attributional model best fits two-sided messages and whether product claim attributions mediate perceived source credibility.	Experimental. Products: Colour TV and Exterior house paint.	Subjects used attributional processes when receiving promotional messages and two-sided messages led to higher ratings of source truthfulness than one-sided.
Belch (1981).	Examines comparative and non comparative advertising across repetition and message sidedness.	Experimental. Product; toothpaste.	Two-sided appeal was no more effective than the one-sided in either comparative or non comparative appeal conditions. Did not enhance perceptions of advertiser credibility.

<i>Citation</i>	<i>Research Aims</i>	<i>Research Methodology</i>	<i>Major Findings.</i>
Swinyard (1981).	Investigates interactions between credibility and price in comparative/non comparative, one or two-sided messages.	Experimental. Product grocery items.	The two-sided message increased advertiser believability by evoking less counter argumentation of message claims. This effect did not extend to behavioural responses or purchase intentions.
Alpert & Golden (1982).	Compares the effects of one vs. two-sided messages on advertising evaluations and purchase intentions.	Experimental. Product; deodorant.	Two-sided messages were more successful than one-sided on a range of copy variables and product attribute claims for college graduates. For non-graduates the one-sided message was more successful than the two-sided over the same range of copy variables and produced higher purchase intentions.
Etgar & Goodwin (1982).	Tests inoculation theory in a context where no prior beliefs held.	Experimental. Products; beer and cold remedy.	The two-sided message generated significantly better initial attitudes towards a new brand and more positive attitudes toward the appeal.
Chebat & Picard (1985).	Tests involvement as a mediator of two-sided messaging effects where price is also known.	Experimental. Product; range of consumer products.	Message sidedness and involvement both had main effects and a three-way message sidedness, involvement and price interaction occurred. In conditions of low involvement two-sided messages enhanced product confidence when the price was medium. With high involvement, product confidence was enhanced by the two-sided messages when prices were medium and high.
Chebat & Picard (1987).	Tests self acceptance as a mediator of message sidedness effects uses both cognitive and affect responses.	Experimental. Products; soap and car.	Two-sided messages enhanced cognitive but not affective scores; however highly self-accepting recipients scored two-sided messages higher on the affective scale than did other recipients.
Golden & Alpert (1987).	Investigates the relative effects of one and two-sided advertising for two products.	Experimental. Products; mass transit and deodorant.	For mass transit, no effects on consumer perceptions of the service or purchase intentions were found for the two-sided message. For deodorant, the two-sided messages produced stronger positive perceptions of the product attributes and significantly higher purchase intentions.

<i>Citation</i>	<i>Research Aims</i>	<i>Research Methodology</i>	<i>Major Findings.</i>
Kamins & Marks (1987).	Tests the effectiveness of two-sided messaging when an appeal contains puffery.	Experimental. Product; pen.	Following a product trial, in the two-sided conditions product ratings remained constant with increasing levels of puffery. In the one-sided condition product ratings declined given exposure to high levels of puffery. Findings suggest that consumers were more susceptible to deception when exposed to a two-sided refutational appeal than when exposed to a one-sided message.
Kamins & Assael (1987).	Tests the explanatory power of both correspondence and inoculation theories for message sidedness effects.	Experimental. Product; pen.	Finds support for both correspondence inference and inoculation theory. Two-sided appeals led to significantly less counter-argument and source derogation than the one-sided and the refutational appeal led to significantly more supportive arguments. Following a disconfirming product trial, belief change was greater in the one-sided condition.
Chebat, Filiatrault, Laroche & Watson (1988).	Explores the interactive effects of four cognitive variables, source expertise, initial attitudes, number of arguments and message sidedness.	Experimental. Subject; free trade agreement.	The two-sided messages brought about no significant main effects on attitude change, but directional support was found for two-sided messages inducing more attitude change than one-sided. The two-sided messages were more persuasive with fewer arguments, while the one-sided persuasive with large numbers of arguments.
Sorrentino, Bobocel, Gitta, Hewitt & Olson (1988).	Tests uncertainty orientation and personal relevance as mediators of two-sided messaging effects.	Experimental. College exams.	For uncertainty-oriented subjects, in conditions of high personal relevance the two-sided message had higher persuasiveness than the one-sided. For certainty-oriented subjects in conditions of high personal relevance the one-sided message was the most persuasive.

<i>Citation</i>	<i>Research Aims</i>	<i>Research Methodology</i>	<i>Major Findings.</i>
Kamins (1989).	Tests celebrity endorsements in a two-sided message context.	Experimental. Product; home computer.	Across message sidedness conditions celebrity appeals performed better than non-celebrity appeals. Across celebrity conditions the two-sided appeals performed better than the one-sided. Interaction effects occurred between type of spokesperson and message sidedness on attitude to ad, attitude to brand and purchase intention measures. The two-sided celebrity appeal was the most successful.
Kamins, Brand, Hoeke & Moe (1989).	Tests celebrity endorsements in a two-sided message context.	Experimental. Product; management consulting services.	Compared to a one-sided celebrity endorsement, the two-sided message elicited significantly higher advertising credibility and effectiveness ratings, higher sponsor evaluation, and greater intention to use the service.
Hastak & Park (1990)	Investigates mediators of message sidedness effects.	Experimental. Product; pens	For either involved or uninvolved subjects, no effects of message sidedness on brand beliefs or attitude were obtained and therefore no tests of mediating effects were made.
Pechmann (1992).	Tests the effects of correlated attributes in two-sided messages.	Experimental. Product; ice cream.	Two-sided appeals were more effective than one-sided when correlated attributes were featured. The brand's unfavourable positioning on the negative secondary attribute, as well as the advertiser's honesty enhanced judgements of the brand on the primary attribute as well as overall brand evaluation.
Crowley & Hoyer (1994).	Develops an integrative framework to provide explanations of inconsistencies in previous two-sided messaging studies.	Conceptual.	Combines results from studies using inoculation and correspondence inference theories as well as introducing optimal arousal theories to give guidance on two-sided message structure variables.

<i>Citation</i>	<i>Research Aims</i>	<i>Research Methodology</i>	<i>Major Findings.</i>
Tofolli (1997).	Tests message sidedness in a cross-cultural context.	Experimental Product; pen.	In terms of favourable cognitive response, two-sided advertisements were more effective than one-sided for individualists, while the reverse occurred for collectivist subjects. Directional support for this effect found for attitude toward the primary attribute and attitude toward the brand.
Bohner, Einwiller, Erb & Siebler (2003).	Tests the use of correlated attributes.	Experimental. Product; restaurant.	Two-sided message increased source credibility compared to one-sided. Use of related attributes facilitated favourable inferences about the product attributes particularly when recipient processing effort was high.

Table 2.5 Theoretical bases to message sidedness effects

<i>Study</i>	<i>Innoculation Theory</i>	<i>Attribution Theory (Augmenting and discounting principles)</i>	<i>Correspondence inference Theory</i>	<i>Elaborative Cognitive Response &/ or Mediating Effects</i>	<i>Optimal Arousal Theory</i>
Bither, Dolich & Nell (1971)	✓				
Sawyer (1973)	✓				
Szybillo & Heslin (1973)	✓				
Settle & Golden (1974)		✓			
Smith & Hunt (1974)			✓		
Swinyard (1981)			✓		
Belch (1981)			✓		
Alpert & Golden (1982)			✓		
Etgar & Goodwin (1982)	✓				
Chebat & Picard (1985)			✓		
Chebat & Picard (1987)				✓	
Golden & Alpert (1987)		✓			
Kamins & Marks (1987)	✓				
Kamins & Assael (1987)	✓		✓		
Sorrentino, Bobocel, Gitta, Hewitt & Olson (1988)				✓	
Kamins (1989)			✓		
Hastak & Park (1990)				✓	
Hale, Mongeau & Thomas(1991)				✓	
Pechmann (1992)			✓		
Crowley & Hoyer (1994) (conceptual)	✓		✓		✓
Bohner, Ehiniller, Erb, & Siebler (2003)				✓	

2.3.3.1 Innoculation Theory

Inoculation theory (Papageorgis & McGuire, 1961; McGuire, 1964) uses a physiological metaphor to suggest that strongly held beliefs become vulnerable to attack through counterarguments unless measures are taken to protect those beliefs through immunisation. When applied to two-sided messaging studies, inoculation theory suggests that a two-sided refutational message strengthens cognitions through

the use of mild attacking arguments, which are then countered or refuted within the same message, leading to stronger persuasive effects.

The type of defences used are important, McGuire (1961, 1964) found that while any defence conferred more resistance than no defence at all, refutational defences which specifically refute the attacking argument were more successful than supportive defences, which attempt to bolster support for the original notion without refuting the counter argument. Of the refutational defences, those that used the same argument as that being attacked built slightly higher resistance to persuasion than those using different arguments. Bither et al. (1971), Sawyer (1973) and Szybillo and Heslin, (1973) used inoculation theories in their early message sidedness studies. These researchers found that two-sided refutational messages were more effective at strengthening and reinforcing beliefs than one-sided. Crowley and Hoyer (1994) summarise their results as finding that *“favourable attitudes based on two-sided refutational appeals may be more resistant to change when confronted by counter attitudinal appeals”* (p. 562) and this was heightened amongst those whose initial attitudes were negative. Similar effects were found by Belch (1981) in a study on comparative advertising using a brand of toothpaste, Swinyard (1981) in the context of a comparative advertising study using grocery products and Kamins and Assael (1987) in an experiment using pens. These authors all used a cognitive response approach, measuring the levels of counter and support argumentation of the subjects. Findings indicate that in all three studies, the two-sided message reduced counter arguing and increased supportive arguing of message content.

Many researchers have also found beneficial credibility effects for two-sided refutational and non-refutational appeals, see for example, Golden and Alpert (1987); Kamins and Marks (1987); Kamins et al. (1989); Settle and Golden (1974), and rather than using inoculation theories to explain these results, have used alternative frameworks such as the attribution theories of correspondence inference and the augmenting and discounting principles.

2.3.3.2 Correspondence Inference and the Augmentation and Discounting Principles

First discussed in the context of message sidedness by Smith and Hunt (1978), correspondence inference theories (Jones & Davis, 1965) describe a process whereby an attributor, (in this case a message receiver), ascribes a cause to an act (in this case the message), by an actor (the message source). Internal causes are reflective of the actual dispositional properties of an actor, and if an internal attribution is made, it is said to be correspondent, that is, the receiver sees the source's behaviour in delivering the message as aligning with his/her true dispositions, for example, in an advertising context, a consumer who believes that the content of an appeal reflects the source's true beliefs about a product is making a correspondent or internal attribution. If a receiver attributes a message to situational factors, such as a source's desire to sell the product, the attribution is described as non-correspondent or external, because no relationship is necessarily seen between the actor's behaviour and his or her true dispositions (Smith & Hunt, 1978). Further to this, the augmentation and discounting principles (Kelly, 1973) suggest that if a number of plausible causes exist, the role of any one of them is likely to be discounted when attributions are made, and that behaviour that is consistent with social expectations reveals less about the unique characteristics of a person than behaviour that is contrary to expectations. In the

typical one-sided advertising appeal containing only supportive information, a consumer may make causal attributions on any of a number of factors, for example;

1. The advertiser is telling the truth,
2. The advertiser just wants to sell the product,
3. The advertiser is just doing what all advertisers do

The role of any one of these possible causes is discounted because of the plausibility of the other causes, making a correspondent attribution less likely. In a two-sided message, the advertiser intentionally includes information that derogates the product, a form of advertising that is both unusual and unexpected. The possibility of attributing the cause to advertiser truthfulness is augmented, because by including derogatory information, the advertiser is acting unexpectedly (contrary to cause 3), and in a manner contradictory to the sales goal (contrary to cause 2). The message therefore appears to be more informative about the source's true characteristics, with the advertiser's actions appearing to be the result of increased honesty (Hansen and Scott cited in Tofolli, 1997).

It follows, therefore, that when correspondent or internal attributions are made, the credibility and believability of both the source and the message should increase and these effects have been found by Chebat and Picard (1987), Golden and Alpert (1987), Kamins and Assael (1987), Settle and Golden (1974) and Smith and Hunt (1978). While studies have been performed without any significant effects reported (for example Hastak and Park (1990)) increased source believability is one of the most consistent findings of two-sided messaging studies. Less consistent have been findings showing that increased source believability and truthfulness lead to more positive brand attitudes or purchase intentions. While Etgar and Goodwin (1982)

found their two-sided comparative messages led to more positive brand attitudes and purchase intentions, and Kamins (1989) found an interaction effect for two-sided messaging and celebrity endorsement on purchase intentions of a new computer, many other researchers have found no significant effects. Examples include Sawyer (1973), no effects for a refutational appeal on purchase intention; Swinyard (1981) no grocery coupon redemption or intention effect; Golden and Alpert (1987) no effect for purchase intention for mass transit, although an effect was found for deodorant; Kamins and Assael (1987), no purchase intention effects for pens; Hastak and Park (1990), no effects on brand beliefs or attitudes and Bohner, Einwiller, Erb and Siebler (2003), enhanced communicator credibility did not carry over to more favourable attitude judgements. It appears therefore that the increased credibility associated with two-sided messages has a greater effect on increasing source and message believability than on influencing attitudes towards specific products or purchase intentions.

One study that tested both the inoculation and the correspondence inference theories is that of Kamins and Assael (1987) who used thought listing procedures to test for differences in cognitive responses to refutational and non-refutational two-sided and one-sided appeals. Significant differences between the one-sided and two-sided messages existed, with higher levels of counter argumentation found for the one-sided, and lower levels found for the two-sided refutational appeal. Higher levels of support argumentation were found for the two-sided refutational appeal and lower levels for the one-sided, these results lending support to inoculation theory. Similar significant differences were found for source derogation, with significantly higher levels occurring in the one-sided than in either of the two-sided appeals, giving

support to correspondence inference theories. The authors suggest that inoculation theories do not appear to dominate over correspondence inference theories and are therefore complementary rather than competing explanations of message sidedness effects. Following a second experiment in which subjects were exposed to a disconfirming product trial, the authors suggest that counter or supportive cognitive responses may be more important as belief change mediators than source attribute variables. A discussion of the mediating effects of cognitive responses now follows, after which the results of studies relating to additional mediating variables will be examined.

2.3.3.3 The Mediating Effects of Cognitive Elaboration

All studies sourced used a cognitive approach to understanding two-sided messaging effects, although some such as Chebat and Picard (1987) have investigated how two-sided messages may influence the affect elements of source credibility (see below). Most commonly, cognitive response models and the dual process theory of the Elaboration Likelihood Model (ELM) are used to determine the main, interaction and mediating effects of different individual variables studied in a two-sided messaging context. For example, Chebat, Filiatrault, Laroche and Watson (1988) used a cognitive response approach to measure effects of source, message and receiver characteristics on attitude change, finding interaction effects between numbers of arguments, message sidedness and source expertise. Bohner, Einwiller, Erb and Siebler (2003) explicitly address the role of elaborative processing in their study, finding that content inferences enhance the persuasive impact of two-sided messages for recipients who invest in high amounts of processing. Other mediating variables studied include involvement, self acceptance and uncertainty orientation and these are discussed next.

Involvement

Chebat and Picard (1985) found results suggesting that two-sided messages enhance confidence in both the message and the product in conditions of high involvement. They also found three-way interaction effects for price, involvement and message sidedness on confidence in the advertising appeal, so that in conditions of low involvement two-sided messages enhance product confidence only when price is medium, but when involvement is high, product confidence is enhanced by two-sided messages when prices are both medium and high. Chebat and Picard's (1987) study confirmed the mediating role of involvement on cognitive acceptance of a two-sided message, however, in a further study testing the mediating effects of involvement, Hastak and Park (1990) were unable to discover any message sidedness effects on either brand beliefs or attitude measures, and therefore while involved subjects appeared more sensitive to variations in message structure, mediating effects were unable to be measured.

Self Acceptance

Chebat and Picard (1987) suggest that the failure to make a clear distinction between cognitive and affective responses may be a reason for previous contradictory findings of message sidedness effects on credibility. In investigating how a receiver's level of self-acceptance may mediate message sidedness effects, they found that two-sidedness, (as well as product type and involvement levels) enhanced cognitive acceptance of the message. Two-sidedness did not have a main effect on affective scores, however an interaction effect between two-sidedness and self-acceptance occurred, so that only highly self-accepting individuals showed a preference for two-sided messages when measured on an affective scale. The authors argue therefore that a threshold of self-acceptance level may exist, *"beyond which individuals are*

likely to be more accepting of two-sided messages, and that failure to control for self-acceptance can conceal the variability in efficacy of message.” (p. 360).

Uncertainty Orientation

A further individual difference variable investigated is uncertainty orientation, (Sorrentino, Bobocel, Gitta, Hewitt & Olson, 1988). Uncertainty orientation refers to an individual's approach to ambiguity or uncertainty. An uncertainty oriented individual is expected to be more motivated to carry out in depth information processing in situations that involve ambiguity about the self and/or environment, and is more likely to use heuristic cues in situations of certainty. Certainty oriented individuals are expected to be motivated in the opposite way, being more likely to engage in deep processing in situations that provide a sense of certainty about the self or environment, and more likely to use heuristic cues when faced with ambiguity. The authors tested this difference using levels of personal relevance as a motivator and found a three-way interaction effect between personal relevance, uncertainty orientation and message sidedness. As personal relevance increased, uncertainty oriented subjects behaved like most attitude theorists assume everyone behaves (p. 363) and were more influenced by two-sided messages and less by one-sided messages. Certainty oriented subjects demonstrated the opposite pattern, in conditions of high personal relevance they were less persuaded by the two-sided message and more persuaded by the one-sided. The authors maintain that this individual difference is an important measure for both general information processing and specific message sidedness effects, because only uncertainty oriented individuals behave in a manner consistent with current information processing theories, while certainty oriented persons behave in the opposite manner.

Optimal Arousal Theory

One theory relatively more recently put forward to explain message sidedness effects is Optimal Arousal Theory (Crowley & Hoyer, 1994). This theory posits that moderately novel, surprising or complex stimuli will be preferred over that which offers either too much or too little novelty. The amount of novel stimuli giving rise to this effect is based on an adaptation level, minor deviations from which may generate positive effect, while large discrepancies create a negative effect (Berlyne 1971; McClelland, 1953 both cited in Crowley and Hoyer, 1994). Crowley and Hoyer suggest that two-sided messages may be considered pleasingly novel, and thus lead to positive affect, while one-sided messages, being the norm, may represent the adaptation level. Optimal Arousal Theory has been used to provide guidance for the effective structure of effective two-sided messaging as is discussed further below.

2.3.3.4 Message Sidedness – An Integrative Framework

Crowley and Hoyer (1994) contend that message structure has a crucial impact on receiver reactions, and by summarising structural elements sourced from the one vs. two-sided literature, they developed a series of propositions for maximising the persuasive effects of two-sided messages. From Golden and Alpert (1987) they suggest limiting the amount of negative information to a maximum of 40% of the total, from Hass and Linder (1972) and Kamins and Assael (1987) they recommend presenting negative information early (but not first) in the message, from Stayman, Hoyer and Leone (1987) (cited in Crowley & Hoyer, 1994), they suggest discounting attributes of low to moderate importance only. Based on the inconsistencies found for refutational statements, they suggest using refutations of a negative claim only when important attributes are being disclaimed. Finally, based on Pechmann's (1992) results, they suggest the use of correlated positive and negative attributes, such as

high price and high quality (Etgar & Goodwin, 1982), high calories and rich creamy ice-cream taste (Pechmann, 1992), small and comfortable restaurants (Bohner, Einwiller, Erb & Siebler, 2003) to strengthen consumer beliefs about positive product attributes.

2.3.4 Message Sidedness and This Study

While the biotechnologies used in GM food production are relatively new and not well understood by lay people, there is some awareness that they have the potential to alter many of the food products that people purchase and consume daily. As outlined in section one of this chapter, consumer opposition toward these new technologies and food products exists, making this a controversial context in which the effectiveness of one vs. two-sided messaging may be measured in influencing attitude change, and enabling Wansink and Kim's (2001) education strategies to be tested. In terms of the remaining variables, to our knowledge, message sidedness has not been manipulated alongside inward vs. outward focus, and only source credibility and involvement appear to have been studied alongside one and two-sidedness, providing an opportunity to study the effects of a range of additional variables. The research will take a cognitive approach, measuring the levels of support and counter argumentation made by subjects and will assess the effectiveness of the two-sided message using inoculation, correspondence inference and the augmenting and discounting principle theories. Where possible, the two-sided messages will be structured to align with the suggestions made by Crowley and Hoyer (1994) and are detailed further in chapter five which outlines the methodological approach taken. Chapter two now continues by outlining the literature associated with inward vs. outward message focus.

2.4 Inward vs. Outward Message Focus

2.4.1 Introduction

The study of inward vs. outward focus (also known as self vs. other orientation) has a long history in social psychology, particularly in gender studies, where an inward focus (self-orientation) is thought of predominantly in terms of maleness while an outward focus (other orientation) is seen as connected and female. Many constructs or variable names have been used to describe these differences including agency and communion, (Bakan, 1966; Carlson, 1971, 1972), connectedness and separateness (Markus & Oyserman, 1989), independent vs. interdependent self construal, (Cross and Madson, 1997; Markus & Kitayama, 1991), and caring vs. justice world views (Brunel & Nelson, 2000; Gilligan, 1982). Cross-culturally, Triandis' (1995) concept of individualism and collectivism (population level) and allocentricism and idiocentricism (individual level) is used to explain similar differences between country populations. This section begins with a discussion of the theoretical development of these constructs and then goes on to describe the associated effects on information processing and persuasion. These discussions include an examination of two influential explanations of inward vs. outward message focus, the selectivity hypothesis and the separated vs. connected self-schemata. Section 2.3 then concludes with a discussion of inward vs. outward focus in the context of this study.

2.4.2 Theoretical Development of Inward vs. Outward Focus

Social psychologists and gender researchers, particularly those writing from a feminist perspective through the 1970's and 1980's, have largely driven work in areas

related to inward vs. outward focus and self vs. other-orientation. An extensive body of research has been devoted to exploring the differences between the genders, for example, studies related to Gender Schema Theory (Bem, 1974, 1981), Gender Identity Theory (Spence, 1993), and sex role self concept (Allison, Golden, Mullet & Coogan, 1980), however these theories have produced little in the way of significant findings in consumer behaviour studies (Hupfer, 2002; Palan, 2001). It was the development of the selectivity hypothesis, (Meyers-Levy, 1988, 1989) and the separated vs. connected self schema (Markus & Oyserman, 1987) that formed the basis for understanding how gender differences in inward vs. outward focus could influence information processing and persuasion. Both of these theoretical developments build on previous work including that of agency and communion (Bakan, 1966), the developmental accounts of separation and attachment (Chodorow, 1978), socialisation theories of dominance and assertiveness in males vs. passivity and submission in females (Janeway, 1980), as well as biological explanations such as differences in perceptual motor skills, (Broverman et al. 1968; Burstein, Bank & Jarvik, 1980), in cognition and spatial awareness (Morrison & Severino, 1997) and in cortical hemisphere functioning (Meyers-Levy, 1994). Cross-cultural researchers have used similar constructs in explaining the differences between individualistic vs. collectivist cultures, with the work on inward vs. outward focus being applied to this context as well. A discussion follows on each of the aforementioned constructs.

2.4.2.1 Agency vs. Communion

One of the most influential typologies advanced to explain differences in inward vs. outward focus is Bakan's (1966) description of agency and communion. Bakan describes the terms agency and communion as characterising "*two fundamental modalities in the existence of living forms, agency for the existence of an organism as*

an individual, and communion for the participation of the individual in some larger organism of which the individual is a part” (p.14). Agency is proposed as characteristically masculine and self-oriented, and manifests itself through self-protection, self-assertion and self-expansion, in separation, isolation, alienation and aloneness. Communion is feminine and other-oriented, manifested through contact, openness, union and co-operation. Agency and communion are seen as dualistic elements present in any individual organism, and integrating the elements of each is a necessary developmental task (Carlson, 1971).

The agency vs. communion framework has been useful in psychological research into gender differences. For example it contributed to the development of Spence and Helmreich’s (1978) Personal Attributes Questionnaire, an instrument that measures the dualistic psychological dimensions of masculinity and femininity in individuals. It has also been used as a basis for segmenting advertising appeals. Hupfer (2002) describes two Mastercard credit card appeals in which an agentic vs. communal split is made in appeals targeting men and women. Both use experience attributes, but the male directed appeal emphasises separation and escape from the world’s pressures, while the female oriented campaign emphasises building relationships and understanding between a mother and daughter.

2.4.2.2 The Developmental Account of Separation vs. Continuity

Chodorow (1978) offers a developmental theory that suggests the early relationship children have with their mothers as primary care givers is fundamental to the difference in self-perceptions between girls and boys. She maintains that daughters see their mothers in terms of similarity and continuity, as a like other, while sons experience a relationship of difference and separation. This leads daughters to learn

to view themselves in relation to their mothers, while boys learn early on to view their selves as different and distinct. Young girls are therefore on the road to developing an orientation that sees the world in terms of their relationship with others, while young boys begin to develop an orientation that sees themselves as separate from the world around them. General social learning perspectives suggest that these differences in male and female orientations continue to be modelled throughout childhood by same-sex parents and significant others who foster and encourage identification by providing examples and reinforcing appropriate behaviour. Males model autonomy and sharp self-other boundaries, while females model connectedness and interdependence in relationships (Markus & Oyserman, 1989).

2.4.2.3 Justice vs. Caring Moral Imperative

In a feminist critique of psychological theory and women's development, Gilligan (1982) provides an alternative to moral stage theory, suggesting that women's moral imperative, or worldview, is significantly different to men's. Gilligan (1982) suggests women have an injunction to care, a responsibility to discern and alleviate the real and recognisable trouble of the world, while for men, the moral imperative appears rather as an injunction for justice and to protect rights to life and self fulfilment from interference. Women's caring worldview is complementary to their other-orientation, while men's justice worldview develops from their orientation towards protecting the rights and obligations of the self. While Gilligan's views of sex differences in moral reasoning have been subject to criticism, (see for example, Walker, 1991), empirical research by Jensen, McGhie and Jensen (1991) has supported the feminine worldview as caring, directed towards people and relationships rather than things or abstractions, while the worldview of men appears characterised by determination, justice, freedom and character, impersonal terms based on individualism rather than relationships. A

study by Brunel and Nelson (2000) showed the justice vs. caring world views explained gender differences found in the evaluations of appeals asking people to give financially to a charity. There is therefore some support for the existence of differing worldviews between men and women.

2.4.2.4 Connectedness vs. Separateness

Markus and Oyserman's (1989) connected vs. separate and Markus & Kityama's (1991) interdependent vs. independent self-schemata, builds on the research of a number of theorists, including that of Bakan's (1966) agency and communion, Chodorow's (1978) developmental theory and Gilligan's (1982) moral imperative work. A self-schema is defined as an affective and/or cognitive structure that represents the self, and is created to lend meaning and coherence to one's experience (Markus & Oyserman, 1989). A person's self-schema influences their thinking, not just about the self, but about all objects, events and situations, and therefore dictates how an individual interprets the world around them. Developmental theories suggest that a person's self-schema develops from the time they are able to individuate themselves at around 18 months of age, and is largely determined by gender based experiences. Ultimately women learn to define themselves in terms of attributes that place them in relation with others, while a male's basic schema places the self as separate from others. Individuality is achieved through the delineation of boundaries between the self and others, so that men define themselves by their sense of independence, assertiveness, instrumentality and competitiveness. Markus and Oyserman (1989) describe women as more likely than men to have a "*collectivist, sociocentric, ensembled, communal or connected self-schema*", in which the self is seen as interdependent or connected with others, while men are more likely to have an "*individualist, egocentric, separate, independent or autonomous schema*" in which

other individuals are represented not as part of the self, but as separate and distinct from it (p.101). Thus men see themselves as independent or separate while women are seen as interdependent or connected.

2.4.2.5 Individualism vs. Collectivism

In terms of cross-cultural work, the terms individualistic and collectivistic are used to describe differently oriented cultures, the differences similar to the agentic vs. communal, independent vs. interdependent or separate vs. connected accounts. In Triandis's (1995) view, individualistic cultures use a single person as the basic unit of social perceptions, emotions are ego based, and individuals focus on personal needs, rights, capacities and contracts, believing in self reliance, hedonism, competition and emotional detachment from in-groups. Collectivistic cultures on the other hand use relationships as the basic unit of social perception, emotions are other-focused, and collectivists think of the needs of the in-group, favouring attitudes that reflect sociability, interdependence and family integrity. While these differences appear similar to the psychological constructs used in gender studies, researchers have found that there are differences between gender and cultural based views, and that different measurement tools are required to gain insights into culture vs. gender based differences, (Kashima, Yamaguchi, Kim, Choi, Gelfand & Yuki (1995); Wang, Bristol, Mowen & Chakraborty, 2000).

2.4.3 Inward vs. Outward Focus and Message Effects

Consumer researchers are concerned with whether these differences in the development of self vs. other-orientation translate into divergent modes of information processing and judgement (Putrevu, 2001) and many studies support the use of inward vs. outwardly focused manipulations in advertising appeals. While some have found effects opposite to those proposed, see for example, Aaker and

Williams (1998) discussed below, most researchers have found that inwardly focused appeals are both used more and have higher effectiveness when directed towards males and individualists, while outwardly focused appeals are more effective for women and collectivists. This has been found over a range of products, such as fragrance, Bonelli (1989), appeals for charity donations, Brunel and Nelson (2000), combinations of private and public goods, Han & Shavitt (1994), financial services Jaffe (1991, 1994), toothpaste and soft drinks, Meyers-Levy (1988) and pens, Wang, Bristol, Mowen & Chakraborty (2000). Explanations for these effects have been based on the differences in information processing styles between genders or cultures, largely through either the selectivity hypothesis of Meyers-Levy (1988, 1989), or the separated vs. connected self construal of Markus & Oyserman (1989), and Markus & Kitayama (1991).

Table 2.6 outlines the literature that deals with development, information processing and persuasion effects associated with inward vs. outward focus particularly in an advertising context. This is followed by a discussion of the most influential hypotheses put forward to explain the differences found in information processing styles associated with these.

Table 2.6: Inward vs. outward message empirical effects

<i>Citation</i>	<i>Research Aims</i>	<i>Research Methodology</i>	<i>Major Findings.</i>
<i>Gender effects</i>			
Markus & Oyserman (1989).	Discusses separate vs. connected self construal, their development and implications.	Conceptual.	Self-schema – an affective/cognitive structure created to lend meaning and coherence to one’s experience. Men are more likely to have a separated self-schema, women a connected self schema. The connected self-schema gives rise to a mode of thinking which is particularly sensitive to the surrounding social environment. A separated self-schema is disconnected from the social context enabling objectivity, critical thinking and doubting.
Meyers-Levy (1988).	Examines whether the agentic vs. the communal sex role distinction applies to persuasive communication.	Experimental. Product: toothpaste & soft drinks. Country: US.	When a sex role prime was administered prior to message exposure, males were more favourable to the self-oriented message, females were equally favourable to both the self and other-oriented messages. It appears that consistency between the values represented in an appeal and the genders’ activated sex roles effected persuasion. When the prime was absent, gender differences were eliminated.
Meyers-Levy (1989).	Explains the selectivity hypothesis.	Conceptual.	Males streamline external information by focusing on self-related information, a heuristic device on which they base judgements or behaviours. Females comprehensively elaborate external information, devoting equal processing to information relevant to the self and that relevant to others.

<i>Citation</i>	<i>Research Aims</i>	<i>Research Methodology</i>	<i>Major Findings.</i>
Meyers-Levy & Maheswaran (1991).	Examines gender differences in message processing.	Experimental. Product: TV programme. Used recall and recognition tasks.	Females' processing often entails substantial detailed elaboration of message content, while overall message themes or schemas drive males' processing. Difference was eliminated when message characteristics motivated both genders to engage in detailed processing.
Bonelli, (1989).	Examines sex role stereotyping in fragrance appeals targeting men and women.	Content analysis of magazine based appeals for fragrance. Country; USA.	When appeals were targeting women, a pattern of stereotyping occurred which characterised women as externally or other-oriented, concerned primarily with their appearance and relationships with men. When the appeals were targeting men they used simple ego gratification, stereotyping men as internally or self-oriented, concerned primarily with themselves.
Meyers-Levy & Sternthal (1991).	Examines gender differences in elaboration threshold in the context of product judgements.	Experimental. Product: TV show and toothpaste. Country: USA.	Women have lower thresholds for elaborating on message cues and made greater use of cognitive elaborations when making product judgements than men. Gender differences were eliminated when message cues prompted so little attention that they were below the cognitive elaboration threshold level for both males and females, or were so high that both genders' threshold was exceeded. Women's communal orientation made them concerned with a broader array of information than men.
Jaffe (1991).	Tests several positioning strategies for financial services targeting women, and suggests ways to attract different female segments.	Experiment.	Compared modern (agentic) with traditional (communal) role portrayal in appeals for financial services. Finds women rating higher on masculinity scores preferred modern appeal, while women rating lower on masculinity scores showed no differences between the two. Modern positioning had higher purchase probability overall, more important for low femininity women.

<i>Citation</i>	<i>Research Aims</i>	<i>Research Methodology</i>	<i>Major Findings.</i>
Jaffe (1994)	Explains the roles of masculinity, femininity and androgyny in explaining women's response to sex role portrayals.	Experiment.	For women scoring high on the masculine and low on the feminine scales, the modern positioning elicited higher response than the traditional appeal. For both purchase probability and information interest the modern agentic appeal was preferred.
Meyers-Levy (1994).	Explains why genders differ in information processing style.	Conceptual.	Differences in gender processing are due to differences in the use of right and left hemisphere cortical functions. Males prefer a holistic, undifferentiated manner of processing consistent with the processing style of the right hemisphere. Females pursue a more detailed elaborative processing style, reflecting use of the left hemisphere.
Darley & Smith (1995).	Examines the selectivity hypothesis.	Experiment.	Females were equally responsive to objective and subjective claims when risk was low, but as risk increased females shifted to favouring objective claims. Males did not respond more favourably to objective rather than subjective claims, neither did they change processing styles between risk conditions. Partially supported the selectivity hypothesis.
Cross & Madson (1997).	Discusses independent and interdependent self construal and the different cognitive and affect results these may have.	Conceptual.	In information processing, an independent self- construal leads to attending closely to, encoding, organising, and remembering information that highlights uniqueness and individuality. An interdependent self-construal leads to attending closely to, encoding, organising, and having a superior memory for information about relationships. Women more likely to express negative and relationship based emotions, and men less likely to express these.

<i>Cross cultural</i>			
Hupfer (2002).	Examines practitioner and theoretical debate about sex specific advertising strategies.	Conceptual.	Suggests that the selectivity hypothesis be revisited to allow for the examination of biological sex independently of measurable aspects of gender identity such as self and other-orientation. This would allow for the incorporation of self and other-orientation as possible moderators of ability and or motivation for message elaboration.
Markus & Kitayama (1991).	Discusses independent vs. interdependent self -onstrual in a cross-cultural context.	Conceptual.	Discusses cultural differences in independent vs. interdependent self-construal. Expects to find differences in cognition, emotion and motivation.
Han & Shavitt (1994.)	Examines how individualism and collectivism is reflected in advertising in the USA and Korea.	Study one: Content Analysis. Study two: Experiment using private and public goods. Country, US & Korea.	Appeals in the USA employed individual benefits to a greater extent while Korean appeals emphasised in-group benefits to a greater extent. In the US, individualistic benefits were more persuasive than collectivist benefits. Those using in-group benefits were less persuasive in the US than in Korea. Differences were much clearer with public vs. private goods.
Aaker & Williams (1998).	Examines the persuasive effect of emotional appeals on members of collectivist vs. individualist cultures.	Experiment using film. Country: US and China.	Results suggested that ego focused appeals (vs. other focused emotional appeals) led to more favourable responses in collectivist cultures. Other focused appeals (rather than ego focused) led to more favourable responses in individualistic cultures. These results were surprising and explained on the basis of the generation and elaboration of novel thoughts.

<i>Citation</i>	<i>Research Aims</i>	<i>Research Methodology</i>	<i>Major Findings.</i>
<i>World-view effects</i>			
Jensen, McGhie & Jensen (1991).	Examines whether men and women have different worldviews.	Survey. Country; USA.	Finds that the female worldview is caring oriented, directed towards peoples and relationships rather than things or abstractions. Male worldview is independent and justice oriented, not directed towards relationships.
Brunel & Nelson (2000).	Examines whether gender is a determinant of viewer response to charity ad appeals and whether moral worldviews mediate gendered responses to charity ads.	Experiment using charity appeals. Country: USA.	Differences exist in the responses of men and women towards charity appeals. Females preferred the help others appeal, while males preferred the help self appeal, as measured on both attitude to ad and ad preference responses. These gender differences were explained through the mediation of justice vs. caring world views.
<i>Gender and culture effects</i>			
Kashima, Yamaguchi, Kim, Choi, Gelfand & Yuki (1995).	Aims to clarify the relationships among individualistic, relational and collective dimensions of the self-construal scale and to examine cultural and gender differences on these dimensions.	Survey. Country; USA, Australia, Japan, Korea and Hawaii.	Tested whether cultural and gender differences may be characterised by different psychological dimensions. Relational dimensions best characterised gender differences, and the individualistic / collectivistic dimensions best described cultural differences.
Wang, Bristol, Mowen & Chakraborty (2000).	Examines how the connectedness-separateness self-schema can explain cross cultural and gender differences in persuasion effects.	Experiment. Product; Pens Country; US and China.	A connected advertising appeal stressing interdependence and togetherness resulted in favourable brand attitudes among Chinese and women consumers.. The separated appeal which stressed independence and autonomy was more persuasive for male and US consumers. Using the connected-separateness scale, the self-orientation dimension accounted for and the dependence dimension accounted for gender level effects.

2.4.3.1 The Selectivity Hypothesis

The selectivity hypothesis (Meyers-Levy, 1988, 1989) proposes that information processing in males focuses on self-related information that acts as a heuristic for judgements or behaviours. The hypothesis suggests that females comprehensively elaborate on information, devoting relatively equal processing to that relevant to both the self and to the external world of others. Meyers-Levy (1988) found when priming activated sex roles, agentic males used only self-relevant information in making product judgements, while females used information relevant to both self and others as a basis for their judgements. Later Meyers-Levy (1994) explained these results as a consequence of differences in left and right cortical hemispheric processing.

The selectivity hypothesis has been tested a number of times. Meyers-Levy & Maheswaren (1991) found that in conditions of low cue incongruity, males used a heuristic based strategy and females a detailed elaborative strategy in recognising information, although this difference disappeared when high cue incongruity led to detailed processing by both males and females. Meyers-Levy & Sternthal (1991) found a lower threshold for information processing in women rather than men, suggesting that women were more likely to rely on a broader array of information in making judgements. Other studies have been less supportive of the selectivity hypothesis. Darley & Smith (1995) found that it was more successful at explaining females processing strategies than males, with females equally weighting subjective and objective information in low risk conditions, while unexpectedly, males did not show greater preference for the objective over the subjective information. Females showed a preference for the objective information in high-risk conditions, while males did not alter their processing strategies at all. The authors suggest that risk may

moderate processing strategies for females, but that their results give only partial support to the selectivity hypothesis. Peracchio & Tybout (1996) found effects opposite to those proposed in the selectivity hypothesis for product judgements. In their study, females showed greater reliance on schematic based inferences and males were found to elaborate more on data contained in a product description. Indeed, Hupfer (2002) points out that if females do possess an enhanced propensity for elaboration relative to males, these effects should be more evident throughout psychology and marketing literature; however, in many studies cognitive differences within sex are often greater than those between the sexes. She suggests that future work places less emphasis on biological sex and that self vs. other-orientation be used as a possible moderator of ability and motivation for message elaboration.

2.4.3.2 Separated vs. Connected Self Schemata

Markus & Oyserman (1989) propose an explanation for many empirical results by suggesting that a connected self-schema results in thinking which is particularly sensitive to the surrounding social environment, and in which the social context is incorporated into the representation of the focal person or object. A separated self-construal on the other hand, is disconnected from the social context enabling greater objectivity, critical thinking and doubting. Markus and Kitayama (1991) discuss expected differences between independent and interdependent self-construal in terms of cognition and affect. For cognition they expect that interdependent selves are likely to elaborate more on messages focusing on others or the self in relation to others (outwardly focused), while for independent selves, they expect there will be greater elaboration on messages focusing on the self (inwardly focused). Cross and Madson (1997) suggest this is because those with interdependent self-construals attend closely to, encode, organise and remember information about relationships,

while the same effects happen for independents when the information highlights uniqueness and individuality. In terms of affect, they suggest that interdependent selves are more likely to express outward focused (e.g. shame, interpersonal communion, sympathy) rather than inward or ego (anger, frustration and pride) focused emotions, while independent selves are more likely to express inward or ego focused rather than outward or other focused emotions. In the one empirical study sourced which tests the affect construct, Aaker and Williams (1998) found that ego focused appeals were more favoured in collectivist cultures, while other focused appeals were more favoured in an individualistic culture. These results were contrary to expectations and explained in terms of the generation and elaboration of novel thoughts.

2.4.4 Inward vs. Outward Message Focus and This Study

The decision to include an inward vs. outward focus manipulation in this study was based upon the nature of the benefits and risks associated with GMFs. As outlined in section one of this chapter, many consumer concerns regarding these products relate to the unknown short and long terms consequences to society as a whole, including the environment, human health in general, and animal welfare. This differs from much consumer research, in that perceived benefits and risk are usually associated with effects on individual consumers only, in terms of the financial, psychological and social implications of purchasing a new product. Because of the broad benefit and risk perceptions associated with GMFs, an inward vs. outward message manipulation presents an opportunity to investigate the differences in individualistic and communal perspectives about these new food products, and to find out whether persuasion can be influenced by reference to both individual as well as broad societal risks and benefits.

It also enables an examination of whether any treatment effects are mediated by the recipient's own inward or outward orientation, as suggested by Hupfer (2002). This study will use Cross and Madson's (1997) suggestion that those with interdependent or connected self-construal (other-oriented) attend closely to, encode, organise and remember information about relationships, while those with independent or separate self-construal (self-oriented) do the same for information highlighting uniqueness and individuality. These effects are discussed in greater detail in the hypotheses included in chapter four. Section four of this chapter concludes the literature review by discussing source credibility.

2.5 Source Credibility

2.5.1 Introduction

Source credibility as a persuasive influence has been widely researched over the last five decades, resulting in a large body of literature investigating its dimensions, main effects and interactions with other persuasion influences. Because of the large volume of literature relating to source credibility the scope of this review is necessarily limited. It will begin by briefly addressing the dimensions, main and interaction effects found, before focusing on the role of source credibility as explained by the Elaboration Likelihood Model (ELM) and concluding by examining the role of source credibility in the context of this study. For a fuller description of source credibility effects, the reader is referred to review papers such as Sternthal Phillips and Dholakia (1978) for a discussion of the early effects found and Pornpitakapan (2004) for a recent review of the empirical evidence of source credibility effects over the past five decades.

2.5.2 Source Credibility Dimensions

Many factors have been proposed as dimensions of source credibility, for example, competence, trustworthiness and dynamism, (Berlo, Lemert & Mertz, 1969), objectivity, (Whitehead, 1968), authoritativeness and character (McCroskey, 1966), likeability, (Petty, Cacioppo & Schumann, 1983) and attractiveness (Ohanian, 1991; Yoon Kim & Kim, 1998). In seminal work, Hovland, Janis and Kelley (1953) determined that source credibility is composed of two dimensions, expertise and trustworthiness. “*Expertise refers to the perceived ability of a source to make valid assertions about the issue*”, while “*trustworthiness derives from the perceived sincerity, honesty and objectivity of the information source.*” (Yoon, Kim & Kim,

p.156). McGinnies and Ward (1980) tested these dimensions to see if they might have differential effects. They found combined trustworthiness and expertise to be the most effective in gaining opinion change, however the trustworthy source was always more influential than the untrustworthy one, regardless of level of expertise. Other studies have shown that trustworthiness is insufficient on its own or may be less important than expertise (Hovland & Weiss, 1951; Kelman & Hovland, 1953). Yoon, Kim and Kim (1998) included an attractiveness dimension along with trustworthiness and expertise in their study, finding that the dimensionality of source credibility was remarkably similar across Korean and Northern American populations. Expertise, trustworthiness and attractiveness all influenced involvement with the advertisement, however, trustworthiness was the only dimension to have a significant impact on attitude toward the brand and brand beliefs, while attractiveness was more important than either expertise or trustworthiness in affecting attitude toward the advertisement.

2.5.3 Main and Interaction Effects

Main effects showing that highly credible sources are more persuasive than low credibility sources were well established in the 1950's and 1960's, (see for example, Hovland & Weiss, 1951; Johnson & Izzett, 1968; Johnson, Torvicia & Poprick, 1968 and Kelman & Hovland, 1953; all cited in Pornpitakpan, 2004), and researchers have extended these findings since. For example, Dholakia and Sternthal (1977) and Dholakia (1986) investigated the impact of low and high credibility sources on behavioural compliance as well as attitude measures, finding that low credibility sources were more successful in producing behavioural compliance using both single (Dholakia & Sternthal, 1977) and repeated behaviour (Dholakia, 1986) measures. They explain these results through self-perception theory, suggesting that attitudes and behaviours mediate source influence differently, so that when attitudes rather than

behavioural responses were used as dependent measures, the highly credible source was marginally more persuasive than the low credibility source. Gotlieb, Gwinner and Schlacter (1987) found when persuading consumers to switch service providers smaller price changes were required when high rather than low credibility sources were used. Finally, Jain and Povosac (2001) investigated the persuasive impact of source credibility on perceptions of search and experience attributes. Their results suggest that highly credible sources can be employed to make experience claims more persuasive.

Researchers have also investigated interaction effects between source credibility and channel, message, and recipient factors and these are briefly addressed below. Table 2.7 outlines the results of later studies showing main and interaction effects. All studies sourced used an experimental design, investigating a range of issues and products.

2.5.3.1 Channel Effects

In terms of channel effects, Worchel, Andreoli & Eason (1975) and Andreoli & Worchel (1978) found television to be the most effective medium for high trustworthy sources, while radio and print media were the least effective. They found the reverse was true for low trustworthy sources. Recent research has investigated the effects of source credibility in an on-line context. Senecal and Nantel (2004) measured the effects of source expertise and trustworthiness on use of online recommendations. They found that a recommender system was perceived as having less expertise than human experts and as being less trustworthy than other consumers, but was more influential as a recommendation source than either of the alternative sources. Other channel effects to be studied include those relating to the direct

experience of the participants and to time compression of a presentation in either radio or television media. These are outlined in table 2.7.

2.5.3.2 Message Effects

Message effects found for high credibility sources include greater persuasiveness when introduced at the outset of an appeal (Greenberg & Tannenbaum, 1961; Ward & McGinnies, 1974) although Sternthal, Dholakia and Leavitt (1978) found this to be true for moderately credible sources, and that high credibility sources had more success when presented toward the end of a message. Presentation of evidence has been shown to assist both low credibility sources (Hendrick & Schaffer, 1970) and low and high credibility sources (Hunt, 1972; Maddux & Rogers, 1980). Finally, credibility times speed of presentation interaction effects were tested by Moore, Hausknecht and Thamodaran (1986). Their results showed positive persuasion effects for high credibility sources when message speed was normal, and when it was compressed and presented at high speed.

Table 2.7: Main and Interaction Message Effects for Source Credibility.

<i>Citation</i>	<i>Research Aims</i>	<i>Major Findings</i>
Johnson & Izett, (1969).	Investigates the relationship between authoritarianism, source credibility, communication type and attitude change.	Only main effects established for authoritarianism and source credibility. The higher credibility source was superior to the lower credibility source.
Dholakia & Sternthal (1977).	Investigates the impact of source credibility on the persuasion measure behavioural compliance.	When behavioural measures were used as an outcome, low credibility sources appeared more influential than high credibility sources. When behavioural measures were not used, the highly credible source did not impact attitudes.
Dholakia (1986).	Investigates whether Dholakia & Sternthal (1977) can be extended to repeated behaviour.	Found that a low credibility source was more effective in eliciting behavioural compliance over time than a highly credible source.
Gotlieb, Gwinner & Schlacter (1987).	Investigates the size of price changes required to motivate consumers to change service providers.	The higher the credibility of the source, the smaller the price change needed to attract new customers.
Yoon, Kim & Kim (1998).	Studies the effect of source credibility on a number of dependent variables to determine whether the dimensions of source credibility emerge in a cross cultural context.	The dimensionality of source credibility was similar across US and Korean cultures. Attractiveness, expertise and trustworthiness equally important for purchase intentions and involvement with the ad. Trustworthiness had a significant impact on attitude to brand and brand beliefs. For attitude to the ad, attractiveness was more important than expertise or trustworthiness.
Jain & Posavac (2001).	Investigates the impact of source credibility on the persuasive impact of experience attributes.	Source credibility impacted search and experience attributes differentially. A high credibility source could be employed to make experience claims more persuasive.

<i>Citation</i>	<i>Research Aims</i>	<i>Major Findings</i>
Greenberg & Tannenbaum (1961).	Investigates the effects of by-lines on attitude change.	Highly credible sources were more effective when introduced at either the beginning or in the middle than at the end.
Aronson, Turner & Carlsmith (1963).	Investigates the relationship between message discrepancy and source credibility.	A highly credible source produced more favourable attitude toward the advocacy than a low credibility source at all levels of message discrepancy. The difference was greatest when message discrepancy was high.
Ward & McGinnies (1964).	Investigates interactive effects between time of presentation and source credibility.	A highly credible source was more persuasive than a low credibility one when identification preceded the message. No source effect found when identification was delayed.
Bochner & Inkso (1966).	Investigates the relationship between message discrepancy and communicator credibility.	When source credibility was high, increasing discrepancy enhanced persuasion. When source credibility was lower a moderate amount of discrepancy was most persuasive. When a recipient was favourably disposed, a low credibility source was more persuasive than a highly credible one.
Koslin, Stoops & Loh (1967).	Investigates source characteristics and discrepancy as determinants of attitude change and conformity.	Source credibility effects lessened at the extreme ends of discrepancy.
Johnson & Steiner (1967).	Measures the interactive effects of source credibility on authoritarianism and conformity.	For high but not low authoritarian people, a highly credible source was more persuasive in situations where no arguments were presented.
Johnson, Torvicia & Poprick (1968).	Investigates the effects of source credibility on authoritarianism and attitude change.	Low rather than high authoritarian subjects were more persuaded by high rather than low credibility source.
Ritchie & Phares (1969).	Tests the interactive effects of source credibility and external locus of control on persuasion.	For external locus of control participants, the highly credible source was more persuasive than the low credibility source. For internal locus of control participants no source credibility effects were found.
Hendrick & Schaffer (1970).	Investigates the effects of arousal and credibility on learning and persuasion.	The use of unfamiliar evidence increased the persuasiveness of low but not high credibility sources.

<i>Citation</i>	<i>Research Aims</i>	<i>Major Findings</i>
Hunt (1972).	Investigates source and message effects in counter-advertising	Both high and low credibility sources were equally effective when a counter advertisement included supportive evidence. The presence of evidence may have overridden source credibility effects.
McGinnies and Ward (1974).	Investigates source credibility and locus of control effects in a cross -cultural context.	Replicated Ritchies & Phares (1969) results for US subjects only. These effects were not replicated for Japanese, Swedish and NZ subjects, and were reversed for Australian subjects.
Topalova (1974).	Investigates the relationship between credibility and message discrepancy on attitude change.	A highly credible source was more persuasive than a low credibility source when message discrepancy was high but not extreme. There was less source credibility effect when discrepancy was low.
Worchel, Andreoli & Eason (1975).	Examines the effectiveness of alternative media channels, bias of communicator, and source credibility on persuasion.	The highly trustworthy source was more persuasive than the low trustworthy one when television was used as the medium regardless of the initial dispositions of the recipient.
Andreoli & Worchel (1978).	Investigates the communicator characteristics that interact with various media to produce attitude change.	For high trustworthy sources, TV was the most effective source and print and media the least effective. The reverse was true for low trustworthy sources. These results held true regardless of the initial dispositions of the message recipients
Sternthal, Dholakia & Leavitt (1978).	Provides a compelling test of the cognitive response explanation for the credibility-persuasion relationship.	When message recipients were favourably disposed to the message, a moderately credible source presented before a message was found more persuasive than a highly credible source. No credibility effects were found when the source was introduced after a message. When message recipients were negatively predisposed, a highly credible source was more persuasive.
Tybout (1978).	Investigated the effectiveness of three persuasion strategies, foot in the door, high salience foot in the door, and straight persuasion.	Found that highly credible sources were more influential than low credibility sources under straight persuasion and foot in the door techniques. For the high salience foot in the door techniques the low credibility source was more effective than the high credibility source.

<i>Citation</i>	<i>Research Aims</i>	<i>Major Findings</i>
Maddux & Rogers (1980).	Compares alternative explanations for the effects of source expertise and attractiveness on persuasion.	A main effect for source expertise was found so that persuasion was greater for expert sources. No effects for source attractiveness were found. No interaction between expertise, attractiveness and supporting argumentation.
Harmon & Coney (1982).	Investigates the interactions between source credibility and initial dispositions.	In the favourable dispositions condition, a moderately credible source was more persuasive than the highly credible source.
Moore, Hausknecht & Abrahams (1986).	Explores divergent findings for source credibility by testing effects of time-compression.	A highly credible source induced more persuasion at normal and high exposure speeds.
Dholakia (1986).	Tests the persistence of the source credibility effect. Uses behavioural compliance as a measure.	A higher degree of non-compliance with requests for behavioural action in high credibility conditions compared to low credibility conditions. When subjects were positively predisposed low credibility source was persuasive.
Chebat, Filiatrault, Laroche & Watson (1988).	Investigates cognitive characteristics of the source, the message and the receiver upon attitude change.	A low expertise source more persuasive than a high expertise source when participants had a favourable disposition. One-sided message with large number of arguments and low expertise source, more influential than high expertise source for subjects who were initially opposed.
DeBono & Harnish (1988).	Investigates interactive effects of source attractiveness, argument quality and self monitoring on persuasion.	High self-monitors always agreed with the expert source, but agreed with the attractive source only when strong arguments were delivered. Low self-monitors always agreed with the attractive source, but agreed with the expert source only when strong arguments were used.
Chebat, Filiatrault & Perrien (1990).	Proposes a model relating credibility to message acceptance mediated by involvement and locus of control.	External locus-of-control subjects more sensitive to source credibility than others. Credibility impacted on message acceptance in both low and high involvement. High involvement enhanced message acceptance.
DeBono & Klein (1993).	Investigates dogmatism, source expertise and persuasion.	Highly dogmatic individuals persuaded by strong arguments when low expertise sources were used, equally persuaded by weak and strong arguments when high expertise sources were used.

2.5.3.3 Receiver Effects

Many receiver variables have been studied in relation to source credibility effects. These include initial disposition; Aronson, Turner and Carlsmith (1963), Bochner and Inkso (1966) and Topolavo (1974) all found that highly credible sources produced greater effects when discrepancy between the message and the recipients' initial attitude was high, although Koslin, Stoops and Loh (1967) found that this effect reduced at extreme levels of discrepancy. Bochner and Inkso, (1966), Dholakia, (1986), Harmon & Coney (1982), Chebat, Filiatrault, Laroche and Watson (1988) and Sternthal, Dholakia and Leavitt, (1978) all found results indicating that low credibility sources were more effective than high credibility sources when initial dispositions were favourable, while Worchel, Andreoli and Eason (1975) and Andreoli and Worchel (1978) found greater effectiveness for high credibility sources regardless of initial dispositions or media used. Individuals own behaviour has been used as a measure for effectiveness of persuasion. Dholakia and Sternthal (1977), Tybout (1978) and Dholakia, (1986) all found greater persuasive effects for low credibility sources when participants were rated on their behavioural compliance to a request. Other receiver variables to be studied include authoritarianism, (Johnson & Steiner, 1968; Johnson, Torvicia & Poprick, 1968; Johnson & Izett, 1969) with results generally suggesting that high credibility sources are more effective for highly authoritarian subjects, although Johnson, Torvicia & Poprick found this effect for low authoritarians and Johnson & Izett found no interaction between authoritarianism and source credibility. DeBono and Klein (1993) found that highly dogmatic individuals tend to be influenced by source credibility cues while DeBono and Harnish (1988) found that expertise and attractiveness could be differentially processed depending on the level of an individual's self monitoring.

2.5.4 Source Credibility and the Dual Processing Models

While source credibility main effects are well established, the literature detailing interaction effects provides a complex array of results. The introduction of the dual process of persuasion model, the Elaboration Likelihood Model (ELM), along with the conceptually similar Heuristic Systemic Model (HSM) provided an integrative framework for understanding persuasion research results including those relating to source credibility effects. An outline of the ELM is presented in section one of this chapter and this section continues with a discussion of the multiple roles that the ELM posits for source factors play in persuasion, before looking at interactive effects for a number of individual difference variables. Table 2.8 summarises studies that have used the ELM or the HSM as a framework to investigate how source credibility dimensions influence persuasion.

Table 2. 8: Studies examining source credibility effects using dual processing models

<i>Citation</i>	<i>Research Aims</i>	<i>Major Findings</i>
Petty & Cacioppo (1980).	Tests the effects of source attractiveness and involvement on persuasion.	Attitudes towards product were affected by endorser attractiveness regardless of involvement level. Endorser attractiveness formed a persuasive cue for low involvement participants and a message argument for high involvement participants.
Chaiken (1980).	Explores the utility of the HSM in explaining persuasion effects of source and credibility cues.	High involvement message recipients employed a systematic processing strategy in which message based cognitions mediated persuasion. Low involvement recipients used a heuristic strategy in which source cues mediated persuasion.
Petty, Cacioppo and Goldman, (1981).	Tests the proposition that source expertise becomes more important as a persuasion cue as the likelihood of elaboration decreases.	Expertise was a more important determinant of attitude change in conditions of low relevance rather than high. It was suggested that source expertise acted as a peripheral cue.
Petty, Cacioppo & Schumann, (1983).	Extends the source expertise results (Petty, Cacioppo & Goldman, 1981) by using source likeability.	Endorser likeability was a more important determinant of attitudes for low rather than high relevance participants, with celebrity endorsers having greater persuasive impact in low involvement conditions.
Puckett, Petty, Cacioppo & Fisher (1983).	Extends the source expertise result by manipulating source attractiveness and argument quality.	Found a social attractiveness by argument quality interaction. The arguments were more carefully processed when presented by a socially attractive source than when presented by a socially unattractive source.
Yalch & Elmore-Yalch (1984)	Investigates the interactive effects of quantification of information and source credibility on persuasion.	Quantitative information stimulated recipients to rely on the source as a basis for judgement. An expert source elicited greater persuasion than did a lower expertise one. In contrast, the presentation of non-quantitative information caused subjects to process the message information so that source expertise had no effect.
Heesacker, Petty and Cacioppo (1984).	Extends the result found by Petty, Cacioppo & Goldman (1981). Tests how source expertise and message quality affect persuasion for field dependent and independent subjects.	An expertise by argument quality interaction found. For field dependent subjects, arguments more carefully processed when presented by an expert. Expertise helped the persuasive impact of strong arguments but was detrimental to the persuasive impact of weak arguments. Field independent subjects showed no source expertise effects.

<i>Citation</i>	<i>Research Aims</i>	<i>Major Findings</i>
Haugtvedt, Petty & Cacioppo, (1986).	Extends Petty & Cacioppo's (1981) and Petty, Cacioppo & Schumann (1983). Investigates whether need for cognition interacts with source attractiveness for persuasion effects.	Subjects low in need for cognition (nfc) were influenced by the simple cue of attractiveness, but people who characteristically enjoyed thinking (high nfc) were not. (In this study source attractiveness was peripheral to the merits of the attitude object).
Wu and Schaffer (1987).	Assesses the effect of direct and indirect experience on the persuasive influence of source credibility.	When subjects had direct experience, source credibility had little effect on persuasion.
Sorrentino, Bobocel, Gitta, Hewitt and Olson (1988)	Investigates the interactions between certainty-uncertainty orientation, argument strength, personal relevance and source expertise on persuasion.	For uncertainty-oriented people, high personal relevance resulted in lower impact of source expertise than low personal relevance, suggestive of central route processing. For certainty-oriented subjects, high personal relevance led to a higher impact of source expertise than low personal relevance, suggestive of peripheral route processing.
Homer & Kahle (1990).	Investigates the interactions between source expertise, timing of source identification and involvement.	In high involvement conditions, source expertise presented early in the message encouraged elaborative processing, and less expert sources resulted in less favourable evaluations. When presented at the end of the message, no effects for source expertise found. In low involvement conditions, expert sources were more persuasive when placed at message end.
Andrews and Shimp (1990).	Tests the ELM predictions in an experimental advertising context.	Supported the ELM predictions concerning cognitive response activity and central and peripheral attitude change. Central route attitude change was influenced by message cognitions. Peripheral route attitude change was determined by both message cognitions and simple source perceptions.
Chaiken & Maheswaran (1994).	Tests the heuristic systemic model by manipulating source credibility in the context of ambiguous messages.	Under low task importance, heuristic processing of the source credibility cue was the sole determinant of subjects' attitudes. When task importance was high and message content was unambiguous, systematic processing determined attitudes. When task importance was high, and messages were ambiguous, heuristic and systematic processing determined attitudes independently.

<i>Citation</i>	<i>Research Aims</i>	<i>Major Findings</i>
Priester & Petty (1995).	Investigates how need for cognition (nfc) and source trustworthiness interact to affect persuasiveness..	Found a three-way interaction between need for cognition (nfc), source trustworthiness and argument strength. High nfc participants were influenced only by argument strength. For low nfc participants, when the source was untrustworthy, argument strength was significant, but when the source was trustworthy, argument strength was not significant.
Kaufman, Stasson & Hart (1999).	Examines how need for cognition (nfc), source credibility and communication strength influence perceptions of a print media communication.	Found a significant need for cognition x source credibility by communication strength interaction. Low nfc subjects in weak communication condition rated article more positively when it was attributed to a high credibility source than when it was attributed to a low credibility source (as predicted by ELM). Source credibility did not affect impressions of the article among high nfc participants, or those reading the strong article.

2.5.4.1 Multiple Roles of Source Credibility

Studies using the ELM to investigate persuasion effects have found multiple roles for source credibility in information processing. Petty, Kasmer, Haugtvedt and Cacioppo (1987) note, “*source factors can serve as persuasive arguments in some situations, act as peripheral cues in others and affect the extent or direction of argument elaboration in still other contexts.*” (p.244) In Haugtvedt, Petty and Cacioppo (1986), source attractiveness was manipulated in an advertising appeal for typewriters. Those participants low in need for cognition were influenced by the attractiveness cue, while those high in need for cognition were not. In this case the authors contend attractiveness acted as a peripheral cue. In an experiment in which attractiveness was central to the evaluation of an advertising appeal, (an appeal for hair shampoo), Petty and Cacioppo (1980) found that attitudes towards the product were equally affected by endorser attractiveness regardless of whether involvement was high or low. Petty, Kasmer, Haugtvedt and Cacioppo, (1987) suggest this as an example of source attractiveness as a peripheral cue for low involvement participants, but as a relevant product argument for highly involved subjects (p. 244). Finally, Puckett, Petty, Cacioppo and Fisher (1983), designed an experiment in which student subjects evaluated essays proposing the introduction of an examination as a prerequisite for college graduation. Involvement was kept to a moderate level by not informing students of when the proposed changes were being planned. The authors found an attractiveness x argument quality interaction, in that arguments were more carefully processed when associated with an attractive rather than an unattractive source. They suggest this indicates source attractiveness affecting the extent of argument elaboration.

Andrews and Shimp (1990) found results supporting a dual role for source credibility. In their study, subjects were exposed to advertising appeals for low alcohol beer, which varied in involvement level (high, low) argument strength (strong, weak) and source credibility (favourable, unfavourable) dimensions. They found that low involvement participants responded to the advertisement in the expected way, their final attitudes being more influenced by source characteristics than message content and therefore source credibility acted as a peripheral cue for this group. High involvement participants were influenced by both message content and source related cognitions, with high credibility sources inducing considerably more positive cognitive responses than low credibility sources. For high involvement subjects, source credibility therefore acted to affect the extent of argument elaboration for high involvement participants. Homer and Kahle (1990) also found results supporting dual roles for source expertise. Their study produced interaction effects between involvement levels (high, low), expertise (high, low) and timing of source identification (start or end of appeal). In high involvement conditions source expertise cues presented early in the message encouraged further processing, and less expert sources resulted in less favourable evaluations. When presented at the end of the message, no effects for source expertise were found for high involvement participants. Source credibility therefore acted to determine the extent of information processing for the high involvement group. When presented at the end of the message no effects for source expertise were found for high involvement participants, while in the low involvement conditions, expert sources appeared to be more persuasive when placed at the end of the message, for the low involvement group, late presentation allowed source credibility to act as a peripheral cue.

Chaiken and Maheswaran (1994) extended these findings using the HSM, by manipulating source credibility (high, low), task importance (high, low), argument strength (strong, weak) and ambiguity (ambiguous, unambiguous) within messages relating to a new telephone answering machine. Their results indicate that in conditions of ambiguous arguments, source credibility has a dual role. In the low task importance conditions, findings replicated earlier work, systematic processing was low and attitudes were influenced only by source credibility, therefore source credibility acted as a heuristic device (or peripheral cue). In the high task importance unambiguous argument conditions, findings also replicated earlier work. Attitudes were based on systematic processing of message content and source credibility had no effect. In conditions combining high task importance with ambiguous arguments, subjects displayed both systematic processing as well as a substantial source credibility effect. In these conditions, source credibility appeared to exert an indirect persuasive influence by biasing systematic processing. The authors contend that two processes were at work. Firstly, the low credibility source worked as a heuristic to negatively bias processing of the arguments, while the high credibility source worked as a heuristic to positively bias processing of the arguments. Secondly, there appeared to be a direct effect of heuristic processing, in which the inference that assertions of high credibility sources were valid led directly to the judgement that the product was superior. In this condition, source credibility worked to both bias information processing and as a heuristic device for decision making.

2.5.4.2 Individual Difference Variables

While the variable involvement is widely used in testing source credibility effects, the interactive effects of other individual difference variables such as need for cognition, field dependence-independence, certainty-uncertainty orientation and direct-indirect experience have also been tested and these are discussed next before the section moves on to look at the role that source credibility takes in this study.

Need for Cognition

Priester and Petty (1995) tested the effects of source honesty on subjects who differed in their level of Need for Cognition (NFC). They found that subjects high in NFC were not affected at all by source honesty. Subjects low in NFC had a low level of message scrutiny when the source was considered honest, although in conditions in which the source was considered dishonest, argument strength was a significant factor. The authors suggest that this indicates that even low NFC individuals may be motivated by an untrustworthy source to process message information. Kaufman, Stasson and Hart (1999) later extended Priester and Petty's experiment by testing source credibility effects on high and low NFC subjects using a print media article. Their study manipulated source credibility by using one of two communication sources, the Washington Post (high) and the National Enquirer (low). The authors found the expected source credibility effects for low NFC subjects when they were presented with a weak communication, but no such effects for high NFC subjects presented with a weak communication. These results are in line with ELM predictions. However when a strong communication was presented, no source communication effects existed regardless of NFC level. These results may again suggest a level of cognitive processing of message information, even

for participants low in NFC. An alternative interpretation could be that the strong communication confounded the source credibility manipulation. In these conditions the researcher's credentials were well established and the theorist behind the article was linked to a recognised research centre, therefore suggesting a highly credible source. It may be that these source manipulations confounded the impact of the using a low credibility newspaper (the National Enquirer), as a cue for testing the NFC effects.

Field Dependence –Independence

Heesacker, Petty and Cacioppo (1984) used source expertise to test for effects on field dependence. This study again used the introduction of a graduating examination for college students as a context. For field dependent subjects, (naturally low information processors) an expertise by argument quality interaction was found, so that arguments were more carefully processed when presented by an expert. Furthermore, expertise helped the persuasive impact of strong arguments but was detrimental to the persuasive impact of weak arguments. Field independent subjects (naturally high information processors) showed no source expertise effects.

Certainty-Uncertainty Orientation

Sorrentino, Bobocel, Gitta, Hewitt and Olson (1988) identified certainty-uncertainty orientation as an individual difference that may affect source credibility influences. Certainty-uncertainty orientation refers to an individual's desire to be placed in situations of ambiguity (uncertainty orientation) vs. their desire to avoid such situations (certainty orientation). Their results support the ELM predictions, but only for uncertainty oriented people. For this group high personal relevance (involvement) resulted in lower impact of source expertise and a higher influence of message arguments than low personal

relevance which is suggestive of central route processing. For certainty-oriented subjects, high personal relevance led to a higher impact of source expertise than low personal relevance, suggestive of peripheral route processing. These results suggest that certainty–uncertainty orientation may impact an individual’s ability to process information, much like need for cognition.

Direct and Indirect Experience

Finally, Wu and Schaffer (1987) extended the Elaboration likelihood framework to include direct and indirect experience of a product as motivating the use of either the central and/or the peripheral frameworks. They found that indirect experience subjects (relying solely on the message) were more influenced by source credibility characteristics than those subjects who had had direct experience with the product. The results showed that a subject’s personal impressions of source reliability predicted the attitudes of indirect experience subjects, but not those of direct experience participants, which were more closely related to their cognitive elaborations of the message arguments.

2.5.5 Source Credibility and This Study

As discussed in section one, Frewer, Howard, Hedderly and Shepherd (1999) found source trustworthiness to be an important determinant of message persuasiveness in the context of information dissemination regarding GM foods. The degree to which a source is considered trustworthy appears to be determined by prior attitudes to Genetic Engineering technologies (Frewer, Scholderer and Bredahl, 2003), although researchers including Frewer, Howard, Hedderley and Shepherd (1996) and Gamble et al. (2000) have identified consumer groups and independent scientists as sources considered

trustworthy, while distrusted sources include industry groups and government agencies. These results will help inform the manipulation of the source credibility variable in the study which is discussed in greater depth in chapter four, the theoretical framework. This study will investigate the degree to which prior attitudes affect perceptions of source credibility and whether source credibility influences persuasion towards a message regarding GM foods.

In terms of the other variables included in this study, the correspondent inference theories and the augmentation and discounting principles provide a theoretical framework for understanding how source credibility and message sidedness interact, which is one focus of the theoretical framework underpinning this study. No studies were sourced which investigated the relationship between source credibility and inward vs. outward focus and Pornpitakpan (2004) suggests that the interaction between source credibility and inner-outer directedness (inward vs. outward focus) is one (of many) areas in which further understanding will be useful. This study will attempt to investigate this relationship further.

2.6 Chapter Summary

Chapter two reviewed the literature available on the context of the study as well as on the three independent variables included, message sidedness, inward vs. outward focus and source credibility. Section two reviewed the previous work on consumer perceptions of GMFs, beginning with a general literature discussion then reviewing the work on ethical considerations, consumer perceptions of benefits and risks, consumer attitude formation, attitude change and purchase intentions. Sections three, four and five each began by introducing the early research carried out, continued by detailing the theoretical development of each of the variables and concluded by discussing why each was included in this study. Building upon this literature review, chapter three presents the aims, methodologies and results of the exploratory work conducted through focus groups and chapter four then presents the theoretical framework to be empirically tested in this study, including a model, the relationships it proposes and the hypotheses relating to the variables discussed in this chapter.

Chapter Three

Qualitative Research Phase

3.1 Introduction

The main study of this research project employs an experimental design to determine the manner in which three message effects (one vs. two sided messaging, inward vs. outward focus and source credibility) influences both cognitive processing and persuasiveness of a message promoting GMFs. Using an experimental approach enables measurement of both the independent and interactive effects of the message manipulations as well as the influence of covariates on the persuasive measures. Attributions of causality are necessarily compromised in all experimental research because of limitations associated with lack of generalisability, method biases and questions of self generated validity. The chosen design however, does allow the independent and interactive relationships between the variables to be uncovered, the extent of their influence to be measured and the influence of extraneous effects to be controlled for through the use of covariates. It is this attempt at measuring the specific influences of the independent variables while controlling for the extraneous effects produced by the covariates that underpins the philosophy adopted in this research project. The exploratory work discussed in this

chapter helps to fulfil this approach by identifying a range of appropriate contextual factors to be used in measuring the effects of the treatment manipulations.

The purpose of chapter three is to address the first two research objectives outlined in chapter one and to build on the literature review contained in chapter two. This is accomplished by reporting on the design, execution and results of two focus groups conducted in June 2003. The chapter firstly presents the methodological approach used and the research aims, examines the results gathered and concludes by discussing how they inform the next phase of the research.

3.2 Methodological Choice and Research Aims

Previous research into New Zealand consumer attitudes has tended toward investigating generalised perceptions towards GMFs (Cook, 2000; Gamble & Gunson 2002; Gamble et al, 2000), rather than consumer perceptions of specific food products. In order to properly inform phase two of the research project, it was felt that greater understanding of New Zealand consumer attitudes towards specific GMF products was necessary, and that qualitative in-depth research would be the most effective way of gaining this knowledge. While a number of qualitative methods are useful for studying consumer attitudes, such as in-depth interviews or participant observation, focus groups tend to be preferred as being both cost effective and timelier than other methods. (Cook, 2000). The most important advantage of focus group research is that it allows for the development of

a range of new perspectives on a topic, particularly as participants build on the thoughts and ideas of each other through group discussions.

There are a number of dangers related to the use of focus groups, such as, the results produced cannot be regarded as generalisable to a whole population, discussions can lead to a degree of ambiguity in interpretation and, if not moderated effectively, the groups can be dominated by one or two participants. However for this research it was decided that focus group discussions were the most cost effective and appropriate means of gaining a deeper view of New Zealand consumer perceptions towards GMFs and to answer the first two research aims outlined in chapter one. These are, firstly, to increase understanding of New Zealand consumer reactions to GMFs in general, and secondly, to identify specific benefits consumers desire from these GM food products. Additionally, the focus groups explored the specific risks and concerns that members perceived arose from the use of GM technologies in food production. Identifying salient product attributes as adding either benefit or risk contributed to the quantitative phase of the study.

3.3 Methodology

3.3.1 Recruitment

In order to generate meaningful discussions, it was felt essential that the focus group participants be consumers with primary or shared responsibility for household food shopping, had enough knowledge to contribute to a discussion about GE, and that they represented a range of opinions across the spectrum, from opposed to supportive. Three

recruitment strategies were used to encourage the involvement of a wide range of participants who fitted these criteria. Firstly, advertising for participants took place in eight primary school newsletters. A stratified sampling technique was used to select the eight schools with the sample frame being a database of primary schools managed by the Christchurch City Library. This gave us access to approximately 2700 households. Of the eight schools contacted, all agreed to run advertisements in their school newsletters. The second technique was a letter drop of 500 households within a suburban area close to the university and the third method was an email sent to a class list of a second year marketing course. Once prospective participants made contact, they were classified into two groups via some screening questions to determine their views on GMFs and given details about the time and place of the meetings.

3.3.2 Participants

Two focus groups took place, and as homogeneity in the area of interest is important in focus group research (Morgan, 1997), the groups were divided between those who were opposed to GMF's and those who were supportive. Because of the difficulty of recruiting sufficient numbers of participants at either extreme, both groups contained members who described themselves as neutral towards the foods. 14 participants were recruited for each group with confirmation calls made prior to the meetings. 12 attended the first group and 10 the second. Of the 22 participants, 10 were female (46%) and 12 (54%) were male. The age range included 12 in the 18 –24 group, six in the 25-34, one each in the 35-44 and 44-54 groups and two above 54. Both groups contained fairly even age spreads with six marketing students included in group one and five in group two

(50% of each group) and the remaining participants being professionals or home executives. Group one contained two reluctant members, group two included one, and both groups had one member each with a tendency to dominate. The remaining participants were happy to contribute independently. The characteristics of difference between the groups were that group one included neutral and opposed members and group two, neutral and supportive participants.

3.3.3 Procedure

An identical format was followed for each group. After introductions each were shown pictures of five different food products, strawberries, margarine, bread, milk, and chicken. All except the margarine were unbranded, and the margarine brand was unavailable in New Zealand. As each picture was shown, the groups were asked to discuss how genetic modification technologies could both improve the products and increase the risk factors or create concerns for the participants. Once a list of benefits and concerns became available, participants identified the most important ranking them accordingly. Each food product discussion lasted about 15 minutes with both groups assembled for a total of 90 minutes.

To ensure that points made by participants were interpreted correctly, each point made was repeated back and the moderator probed for clarity before it was added to the white board. In general, this process worked well. As with all focus groups, there were both dominant and reluctant participants. To help overcome this, the moderator ensured that everyone in the group had an opportunity to participate by asking for specific contributions from the more reluctant on a number of occasions. To appropriately

manage those more dominant, the moderator asked for responses to ideas from other group members. If no responses came forward the idea was not included on the white board or in further analysis. The approach worked well with most ideas generating a discussion, for example, the comments on the economy were discussed by two members of group one after being introduced by the most dominant member of the group. The subsequent analysis and reporting of the groups noted that only two members contributed to the discussion on this topic and therefore the importance given to the topic should reflect this. In general, the approach used led to most members contributing roughly equally and without prompting.

The discussions were audio recorded from which transcripts were made. The author moderated the groups with the help of an assistant who took additional notes and kept time during the discussions.

3.4 Results

The results of the focus groups were coded and analysed based on the approach established by Miles and Huberman (1984) in which the discussion content was categorised and analysed. As the two focus groups were conducted on consecutive evenings, the data collected from both groups were analysed together by the researcher. In the main, issues of interest emerging from the first group emerged in the second as well, with the two exceptions detailed further below. A code frame was developed into which the researcher entered each emerging theme, along with the line number of the

transcript and the product being discussed at the time. Finally, the researcher recorded the overall number of participants from both groups who engaged in discussing each specific theme. Any theme that emerged more than once during the two groups and involved a discussion with at least two participants has been included in the analysis. Connections between the themes were examined both within and between the groups and a series of first order themes using in vivo codes were developed from these connections, which were then conceptualised into second order themes and in most instances, final themes. These themes are reported in table 3.1 and discussed below.

Table 3.1: Conceptual matrix of emerging themes

S= strawberries, M= margarine, B = bread Mi = Milk, C = chicken, number denotes how many participants were engaged in the discussion of the theme

<i>First order themes</i>	<i>Second order themes</i>	<i>Final themes</i>
<ul style="list-style-type: none"> Fat content lowered (all products, 10) Added neutraceuticals (vitamins, minerals and calcium give greater health benefits (S, B, Mi, 5) Removal of protein chains which cause intolerance to glucose, lactose intolerance and allergies (B,Mi, 15) Addition of neutraceuticals carrying health or medical benefits for specific consumer groups (S, B, Mi, 3) Cost reduction(S, M, Mi C, 27) Lowered cost with additional benefits (bigger size, health benefits(S, M, C, 7) Reduced perishability (S, M, B, Mi, 22) Improved consistency (S, M B, 3) Enhanced flavour (S, M, Mi, B, 15) Additional flavours (B, Mi, 2) 	<ul style="list-style-type: none"> Positive effects for human health (general) Positive effects for specific consumer groups Positive shopping benefit Positive product attributes Positive sensory experiences 	<ul style="list-style-type: none"> Enhanced consumer experience
<ul style="list-style-type: none"> Existing health benefits may be altered as a consequence of GM technologies(S, Mi, 8) Introduction of carcinogenic effects as a consequence of GM technologies (S, M 2) Introduction of new allergens as a consequence of new technologies (S, M, 2) Vulnerable groups most affected by any negative outcomes of GM products and processes. (diabetics & children) (S, Mi, 3) Controlling overall intake of vitamins, minerals and neutraceuticals becomes difficult (Mi, B, 6) Negative effect on taste (all products, 7) Natural products become associated with unnaturalness when GM processes are used (S, Mi, 2) Increased longevity associated with increased unnaturalness (S, B, Mi, 6) 	<ul style="list-style-type: none"> Negative effects for consumer health (general) Negative effects for specific consumer groups Negative sensory experience Products become increasingly unnatural 	<ul style="list-style-type: none"> Negatively changed consumer experience

First order themes	Second order themes	Final themes
<ul style="list-style-type: none"> Potential negative effects of transfer of modified genes on human cellular structure (C, 5) Introduction of new bacteria into product (Mi, C, 2) Potential negative effects on human health greater for animal based transgenics than others (C, 5) GM processes may harm the animals (C, 2) modifying animal feed could put the animals at risk (C, 2) 	<ul style="list-style-type: none"> Greater risk of negative effects to humans Animal welfare 	<ul style="list-style-type: none"> Concerns greater with animal based transgenics than other GM technologies
<ul style="list-style-type: none"> Increased disease resistance (S, B, C 8) Less chemical use (cost effective) (S, B, Mi, 5) Increased harvest (S, B, 2) 	<ul style="list-style-type: none"> Improved production process Improved yields 	<ul style="list-style-type: none"> Producer benefits
<ul style="list-style-type: none"> Containment issues with GM crops and animals, there is a high risk of cross contamination if gets out of control (S, M C, 4) If GM technologies create negative outcomes, there will be extensive effects on food chain (S, M, Mi, C, 8) 	<ul style="list-style-type: none"> Negative effects on the environment 	
<ul style="list-style-type: none"> Consumers need to be informed that product has been genetically modified (B, C, Mi, 12) Consumers need to be told how product is GM, labels need explanation (B, Mi, C, 5) Added neutraceuticals need to be clearly shown to differentiate from standard product (Mi, 2) 	<ul style="list-style-type: none"> Consumer information Consumer safety 	<ul style="list-style-type: none"> Labeling
Group one only		
<ul style="list-style-type: none"> Who decides what is a desirable trait (S, 4) Expect a good regulatory system (S, 10) Regulation needs to be balanced, independent (B, 2) Products need to be tested (C, S, 2) 	<ul style="list-style-type: none"> Testing and regulation 	<ul style="list-style-type: none"> Trust in scientists and regulators
<ul style="list-style-type: none"> Oversupply in market, strawberries lose luxury appeal with negative economic consequences for growers (S, 5) Extensive negative economic consequences to NZ if GM technologies go awry. (M, Mi, 2) 	<ul style="list-style-type: none"> Negative economic impacts 	

3.4.1 First, second and final order themes.

The discussions which gave rise to the first, second and final order themes were unprompted and came about in the course of conversations surrounding each product. In the first order column included in Table 3.1, the abbreviation of the product(s) being discussed when the theme emerged is shown, along with the number of participants engaged in the discussion. Unfortunately, time constraints curtailed the discussions on each theme. Final order themes common to both groups include positively enhanced and negatively changed consumer experiences, concerns over animal based transgenics, producer benefits accruing from the use of GM technologies, labelling issues and concerns over the environment. While no overall themes emerged only in group two, the supporters, themes that occurred specifically in discussions with group one, the opposers, included issues of trust in scientists and regulators and the economic impact of GE technologies going awry. A brief examination of each of the themes follows with reference to previous research in which similar issues have emerged. Future research avenues based on these results are outlined in the discussion section.

3.4.1.1 Enhanced Consumer Experience.

As with many previous studies in this field (see table 2.2), both groups were able to identify a range of benefits relating to how genetic modification would enhance the consumer experience associated with the purchase and consumption of foods. Specific benefits related to each product will be discussed in more depth below, but in general, it was thought that the consumer experience would be enhanced through general health benefits, health benefits for specific groups such as children (added neutraceuticals) or those with specific degenerative diseases such as Multiple Sclerosis (added pharmaceuticals)

and shopping benefits (reduced cost). A range of positive product attributes relating to each food product were also identified along with enhanced sensory experiences through better taste, flavour and colour.

3.4.1.2 Negatively Changed Consumer Experience

Alongside the general expectations of improvements to the consumer experience, the participants of both groups identified a range of negative aspects to the purchase and consumption of GMFs. These include a concern for the unknown effects of GMFs on human health, for example, through the introduction of carcinogens into currently healthy food products, and the heightened impact that these negative health effects may have on vulnerable groups such as diabetics and children. Additional concerns include the possibility of negative effects on sensory experiences, particularly relating to altered taste, and the fact that currently natural products such as strawberries and milk will become increasingly unnatural through the use of GM technologies. Table 2.3 highlights international studies which discuss comparative risks and concerns.

3.4.1.3 Animal and Trans-species Applications

As has been found in previous work (Frewer, Hedderley, Howard and Shepherd, 1996; Macer 2003), concerns regarding GM technologies heighten with the increasing complexity of the application. Both current groups expressed concerns over the Genetic Modification of animal DNA and group two vocalised concerns over trans-species applications. The concerns focused on issues of animal welfare (causing distress and pain to the animals) and the risks to human health (the potential for transfer of Genetically Modified proteins to human consumers.)

Both of these concerns have been raised in earlier research; see Miles and Frewer (2001) for animal welfare and Grunert et al. (2001), Miles and Frewer (2001), Rosati and Saba (2000), and Saba and Vasallo (2002) for discussions on risks to human health. It appears therefore that the opinions of our focus group participants were not dissimilar to that of many European consumers in this respect.

3.4.1.4 Producer Benefits

Both groups identified simplified and cost effective production processes through increased disease resistance of crops and the decreased need for pesticide and chemical use as being producer benefits. Both groups discussed pesticide residues as being of some concern, although members of the opposers were sceptical about the ability of GM technologies to provide long term solutions to residue concerns.

P: just really wary that a lot of diseases and things like that can mutate and change themselves so they may create a disease resistant wheat now, but within a year or so a new strain of the disease may come and it could be completely wiped out so...

A second producer benefit identified was the possibility of increased yields through greater climate adaptability of crop based production.

3.4.1.5 The Environment

Concerns for the environment were apparent in both groups with most members contributing some discussion around this issue, even those most strongly supportive of GMFs. Concerns related initially to containment issues with points raised in both groups when discussing plants (strawberries) as well as animals (chickens) which led to

discussions relating to the unintended side effects of the spread of GM crops into the broader food chain

P: if you modify the feed in some way it would put the animals at risk somehow, they might get some disease or something like that

C: in the long term it might not only be cows that eat that feed, like in the long term it might be in the dairy stream and the next thing you know you've got sheep in there.

These environmental concerns have been discussed by many researchers in past work, see for example, Bredahl (1999, 2001), Gamble et al., (2001), Rosati and Saba (2000), and Saba and Vasallo (2002). It appears that concerns over the environment influence much consumer thinking about the use of GM technologies in many different cultures. One notable point to emerge from these focus groups was that the participants made only limited reference to any potentially beneficial environmental affects offered by GM technologies, and then only in regard to the reduction in the use of pesticide residues (see producer benefits). In some previous studies, for example, Frewer, Howard and Shepherd (1996), Bredahl (1999, 2001), Grunert et al. (2001), Magnusson and Hursti (2002) environmental benefits appear to have been more readily identified.

3.4.1.6 Labelling

Both groups identified appropriate labelling of GMFs as necessary, although none of the group members discussed the labelling regulations in place at that time in New Zealand. They were predominately concerned with rights of consumer awareness and saw labelling as necessary in enabling informed purchase decisions of GMFs. Our participants wanted the labels to explain how GM foods had been modified and were concerned with

issues of consumer safety, primarily with milk products which if enhanced by neutraceuticals, needed to be clearly distinguishable from standard products.

Despite the introduction and promotion of labelling laws in New Zealand in December 2001, awareness of these remains low at least among the focus group participants who appeared deeply concerned by the perceived risks of unlabelled GMFs. The lack of knowledge about current labelling laws suggests that the ability of consumers to make informed decisions appears compromised. Other researchers have identified a lack of consumer control as an issue surrounding the acceptance of GMFs (Miles and Frewer, 2001) and these results would suggest that New Zealand consumers could also use current regulations to gain a greater sense of control over their purchasing and consumption behaviours.

3.4.1.7 Trust

Questions were raised by the opposers about the trustworthiness of the scientists, policy makers and regulators involved in the creation and use of GM technologies. Issues related to the trustworthiness of scientists and regulators to alter foods only in a desirable manner and to test the food products sufficiently to ensure their safety. This group also had concerns over the trustworthiness of regulatory bodies, in their ability to put the needs of consumers before the commercial imperatives associated with the development of GMFs.

T: I think that well, from my point of view the consumers got to have trust in the control mechanisms like ERMA or whoever it is, they've got to have faith in them and the government that it's going along the way the majority of the people want, not the commercially viable way.

Frewer, Howard, Hedderley and Shepherd (1999) found trust in the information source to be an important determinant of how people responded to information about genetic engineering technologies. They suggested that biased and self-serving messages were damaging, while characteristics such as knowledge, competence, accountability, truthfulness, accuracy and concern for public welfare enhanced trust in both the source and the message content. Based on the opposer's discussions, it would appear that a degree of mistrust of the intent of scientists, producers and regulators existed. Notably, in the more supportive group two, issues of trust with either the commercial producers or the regulators did not arise. These supportive participants appear more closely aligned in their views to the institutionalists described by Sheehy, Legault and Ireland (1998), Wansink and Kim (2001), and Falk et al. (2002) in that their higher level of trust helped mitigate their opposition towards GMFs.

3.4.1.8 Economic Impact

The effect of GM technologies on the country's economy was a recurring theme in group one, particularly when the discussions related to the risks associated with modifying pastoral farming products such as milk. The concern was that should GM technologies prove dangerous, the economic well being of New Zealand's most significant exporting industry would be at risk. Further, the issue was also raised in regards to horticultural

products such as the economic effects to producers through an oversupply of strawberries:

J: but all that would probably modify cows so again your dairy industry could be at risk... and you could put next to it the economy as a whole because it's a major factor in New Zealand's economy

T: and like New Zealand's clean green image which is really important

Two members of the opposing group largely drove the discussions around economic issues, while the remaining group members contributed little and these issues were not addressed at all in group two. Similarly, in the studies sourced from Europe, Asia, North America and Australia the effects of GE technologies on a country's economy did not appear to weigh heavily on the minds of consumers and therefore this concern may be of limited importance.

The discussion now turns to an examination of five specific food products for which the participants suggested a number of desired improvements, as well as potential risks and concerns that may arise from the use of GM technologies. As the purpose was to examine the participant's perceptions, no attempt was made by the moderator to dictate the scope of the discussion by defining what was and wasn't realistic. One of the supporters contributed by pointing out that genetic modification applications were very difficult to achieve and that changes to any particular product would be both small and well defined. The discussions relating to specific product improvements, risks and concerns were coded using a tree root format enabling each product to be examined individually. The coding was checked against the transcripts prior to the final analysis.

3.4.2 Product Features

The product improvements, risks and concerns considered most important by the focus group participants are summarised in table 3.2. The numbers of participants discussing each benefit or risk factor in group one only (the opposers) are indicated by one asterisk, and those in group two only (the supporters) by two asterisks. No asterisk means both groups considered the idea important. Direct reference to previous research work is not made, as to our knowledge these five products have not previously been discussed in the same context and therefore comparisons with other studies are difficult.

3.4.2.1 Strawberries

The most important improvements desired by participants for strawberries were increased size, enhanced flavour, increased longevity and reduced purchase price. Both groups suggested all three improvements, although reduced purchase price and increased longevity were suggested as the most important improvements by the opposers. Of the risks and concerns, both groups expressed concerns about a reduction in general health properties, however, the opposers articulated a number of additional risks as well, including specific carcinogenic effects produced by a rogue protein or DNA strand and the potential for new allergenic effects resulting from GM processes.

Table 3.2: Product improvements, risks and concerns

<i>Product</i>	<i>Key benefit</i>	<i>Numbers discussing</i>	<i>Key risk and concern</i>	<i>Numbers discussing</i>
Strawberries	Enhanced size	5	Reduced health benefits	6
	Enhanced flavour	5	Carcinogens	2*
	longevity	5	Allergens	2*
	Price advantage	4		
Margarine	Improved product adaptability	6	Flavour altered negatively	2**
	Improved health benefits	12	allergens	2*
	Less fat	6*	Trans fatty acids	2*
	Improved flavour	4		
Bread	Increased freshness	7	Longevity associated with unnaturalness	4
	Increased fibre, soft texture	5	Flavour altered negatively	2**
	Increased longevity	4	Increased fibre leads to negative uptake of vitamins	2*
Milk	Inclusion of pharmaceutical properties	2	Association with unnaturalness	9
	Price advantage	9	Magnification of negative effects through dairy products	2
	Increased vitamins & minerals including calcium	2**	Flavour altered negatively	2**
	Increased longevity	6		
Chicken	Decrease use of antibiotics & hormones	4	Transgenic material transfer to consumers	5*
	Increased size	5	Importation of unknown micro-organisms.	2**
	Lowered fat content	4		
	Reduction in food safety issues	2		

3.4.2.2 Margarine

In the case of margarine, a broad sweep of ideas was considered. As possible improvements, both groups suggested improved use in baking, increased health benefits with less fats being incorporated, improved taste, and enhanced flavour. Of the risks and concerns, the supporters mentioned only one, that the taste may be altered when combined with other foodstuffs. The remaining risks and concerns included the development of new allergens within a margarine product and the emergence of trans-fatty acids as part of the development process.

3.4.2.3 Bread

Of the improvements desired for bread, a lengthened time the product maintained its fresh taste, increased fibre content combined with a soft texture and increased general longevity were considered the most useful. The opposers identified the removal of proteins that cause gluten intolerance and the reduction of sugars and starches as additional benefits. The supporters identified fat free bread and increased carbohydrates as being potential health improvements. Both groups considered the cause and effect of the increased longevity a risk and concern, it was associated with unnaturalness and viewed with some scepticism. The supporters identified altered taste as being a potential negative effect and one member of the opposing group suggested that increased fibre may inhibit the uptake of essential vitamins, a risk to certain segments of the population such as children.

3.4.2.4 Milk

Both groups identified consumer segments that could potentially benefit from the addition of nutraceutical and pharmaceutical properties in milk. Other important improvements included: price reduction, increased levels of calcium, and improved longevity. Of concerns, only one was felt to be of importance by both groups and that was increased unnaturalness. The supporters identified two further issues: firstly, the potential for negative effects to infiltrate many other dairy products such as butter, cheese and ice cream, thereby having an increased impact on the human food chain. Secondly an altered taste to milk when combined with other products such as tea and coffee.

3.4.2.5 Chicken

The final product discussed was chicken. A major concern for both groups regarding chicken products related to farming practises including the use of hormones to stimulate growth and the prophylactic dosing of chickens with antibiotics. A major improvement for these groups would be the farming of chickens without the use of these practices. Other improvements identified include increased size and meat content, decreased fat content, particularly around the skin, and reduced food safety issues such as the spread of campylobacter and salmonella. Of the risks and concerns, the potential for transfer of genetic material from a chicken to the consumer was a concern for some participants, as was the risk of transference of new bacteria's and viruses from chickens to humans. Finally, a generalised health concern was identified as a risk.

3.5 Discussion and Conclusion

The results outlined above confirm that the research aims of the focus groups were met. An increased understanding of consumer perceptions regarding GMFs in general was gained, and specific potential benefits, risks and concerns associated with five different food products were identified. The intent was for the quantitative phase to incorporate the most salient of these, following the suggestions made by Frewer, Scholderer and Bredahl (2003).

Of the benefits, risks and concerns those repeatedly discussed were considered for inclusion in the next experimental phase. Possibilities included improved health, nutrition and flavour, and increased longevity. Of the first three, improvements to health and nutrition were judged to be the easiest to manipulate. Increased longevity aroused mixed feelings within the groups, and based the results previously found (see Renton and Fortin, 2003), it was felt that increased longevity should not be included as a desirable product attribute. Further attributes considered were based on the overall themes that emerged from the discussions and in particular the environmental effects of the use of GM technologies appeared particularly important. Finally, as the issue of trust in scientists, producers and regulators appeared to mark a distinction between the opposers and the supporters, it was decided that an examination of the effect of trust would make a worthwhile contribution. On the basis of these findings, the following chapter (chapter four) discusses the theoretical framework developed to better understand the current phenomenon, introduces a conceptual model and the research hypotheses for the quantitative study.

Chapter Four

Theoretical Framework

4.1 Introduction

This chapter discusses the theoretical framework developed from current understanding of the literature and the qualitative phase of this study. It begins with the presentation of two models from the literature, Bredahl's (2001) determinants of consumer attitudes towards GM foods, and Wansink and Kim's (2001) proposed strategies for educating consumers about GMFs. Then, a discussion of how these are integrated into the study's theoretical framework precedes the presentation of the model underlying this study. The component parts of the model are discussed and finally, the hypotheses proposed for testing are presented.

4.2 Theoretical Models

4.2.1 The Bredahl (2001) and Wansink and Kim (2001) Frameworks

Further to the literature review presented in chapter two, the Bredahl (2001) and Wansink and Kim (2001) frameworks provide a useful starting point for investigating the persuasion effects of advertising appeals for GMFs. Both frameworks are based on a cognitive approach to the formation of consumer attitudes towards GM foods.

Bredahl's framework, pictured in figure 4.1, has been tested through cross-national surveys in four European countries. Results in three of the four suggest that five general variables, attitude to technology, attitude to nature, food neophobia, market place alienation and personal knowledge, inform consumer perceptions of both the perceived risks and the perceived benefits associated with GE foods and that these in turn inform consumer attitudes towards GMFs.

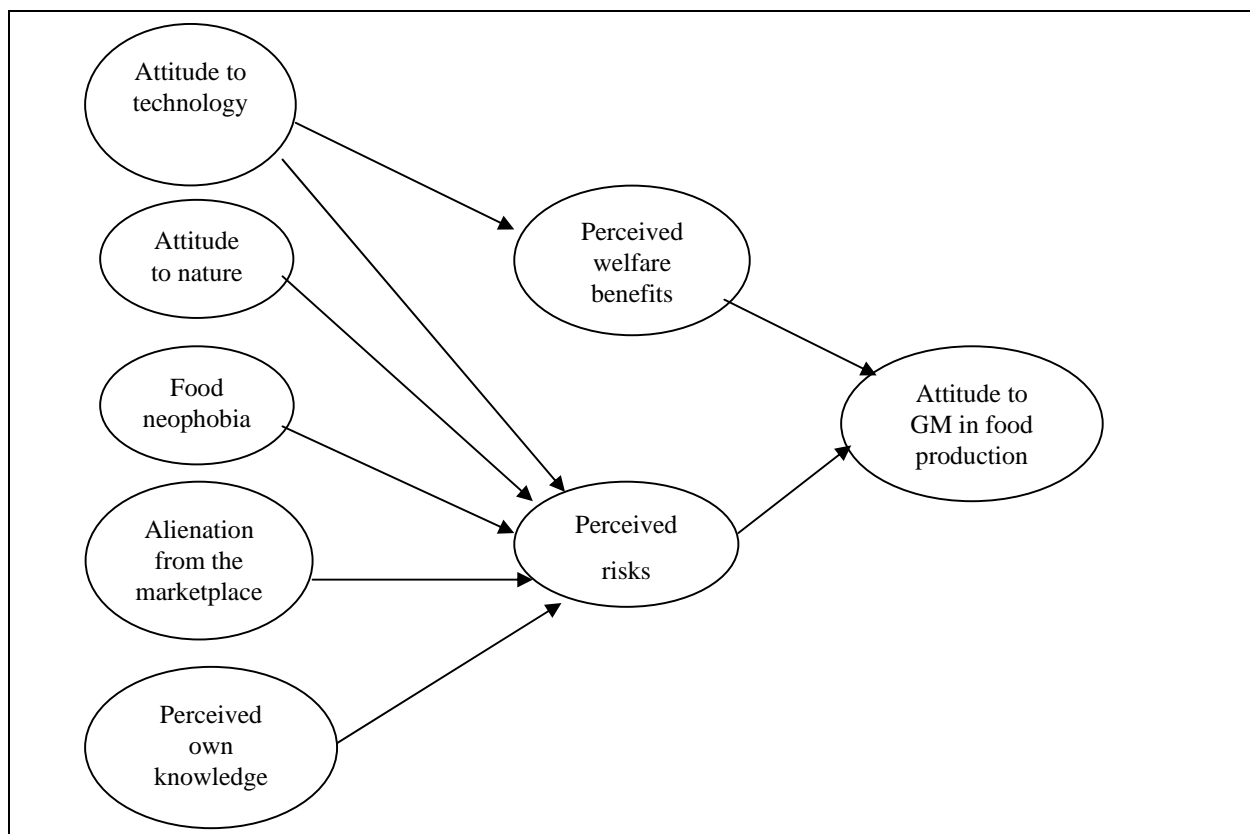


Figure 4. 1: Bredhal's Estimated Attitude Model, Based on Data from Denmark, UK and Germany

Gamble et al. (2000) tested these findings in a New Zealand context and found that attitude to nature had the strongest influence on both perceived risks and benefits, while food neophobia and marketplace alienation played a role in determining perceived benefits. This study extends elements of Bredahl's framework following exposure to an advertising appeal, by examining how perceptions of benefits, perceptions of risk and attitudes towards GMFs impact upon attitudes toward the ad. and purchase intentions.

Wansink and Kim's (2001) education strategies use the ELM's two routes of information processing to propose persuasion techniques for different groups of consumers. The education strategies outlined in figure 4.2 suggest that a two-sided message will be most effective for consumers who engage in central route processing, a one sided message will be more persuasive for those using the peripheral route, and for those with no current attitude, publicity and advertising with visible and credible endorsers will be the most useful. This study proposes to test Wansink and Kim's strategies by measuring the impact of message sidedness, source credibility and cognitive elaboration upon attitude toward the ad. and purchase intention.

<i>Attitude Profile: How existing attitude was formed</i>	<i>Relevant education strategy</i>
Centrally processed attitude	<ul style="list-style-type: none"> • Use two sided message, benefits and risks • Provide reliable statistics • Provide clear evaluation criteria
Peripherally processed attitude	<ul style="list-style-type: none"> • Consistently reinforce attitude • Focus on eliminating illusions and misperceptions • Consistently reinforce attitude with one sided message • Use expert endorsers • Keep them abreast of up to date information
No attitude	<ul style="list-style-type: none"> • Use visible and credible endorser • Minimise misleading publicity • Focus education on basic information • Use publicity and advertising to increase awareness

Figure 4. 2: Wansink and Kim's Education Strategies

4.3 The Proposed Theoretical Model

Figure 4.3 presents the integrated model proposed for this study, which highlights the antecedent effects of three constructs, *message sidedness*, *source credibility*, and *inward vs. outward focus*.

4.3.1 The Antecedent Variables

As discussed above, the inclusion of *message sidedness* and *source credibility* is based on Wansink and Kim's (2001) education strategies. The third antecedent variable, *inward vs. outward message focus*, is included for two reasons. Firstly, because GMFs are associated with perceptions of risks and benefits that could potentially affect society as a whole, the influence of these societal vs. individual risk and benefit perceptions could be significant. The inward vs. outward focus of a message helps to determine the circumstances in which representations of either the broad public benefits and risks vs. the individual benefits and risks could enhance persuasion. Secondly, Pornpitakpan (2004) noted a gap in the literature relating to interaction effects involving source credibility manipulations, and made a call for future research to investigate interaction effects between source credibility, message sidedness and inner versus outer directedness (p 269).

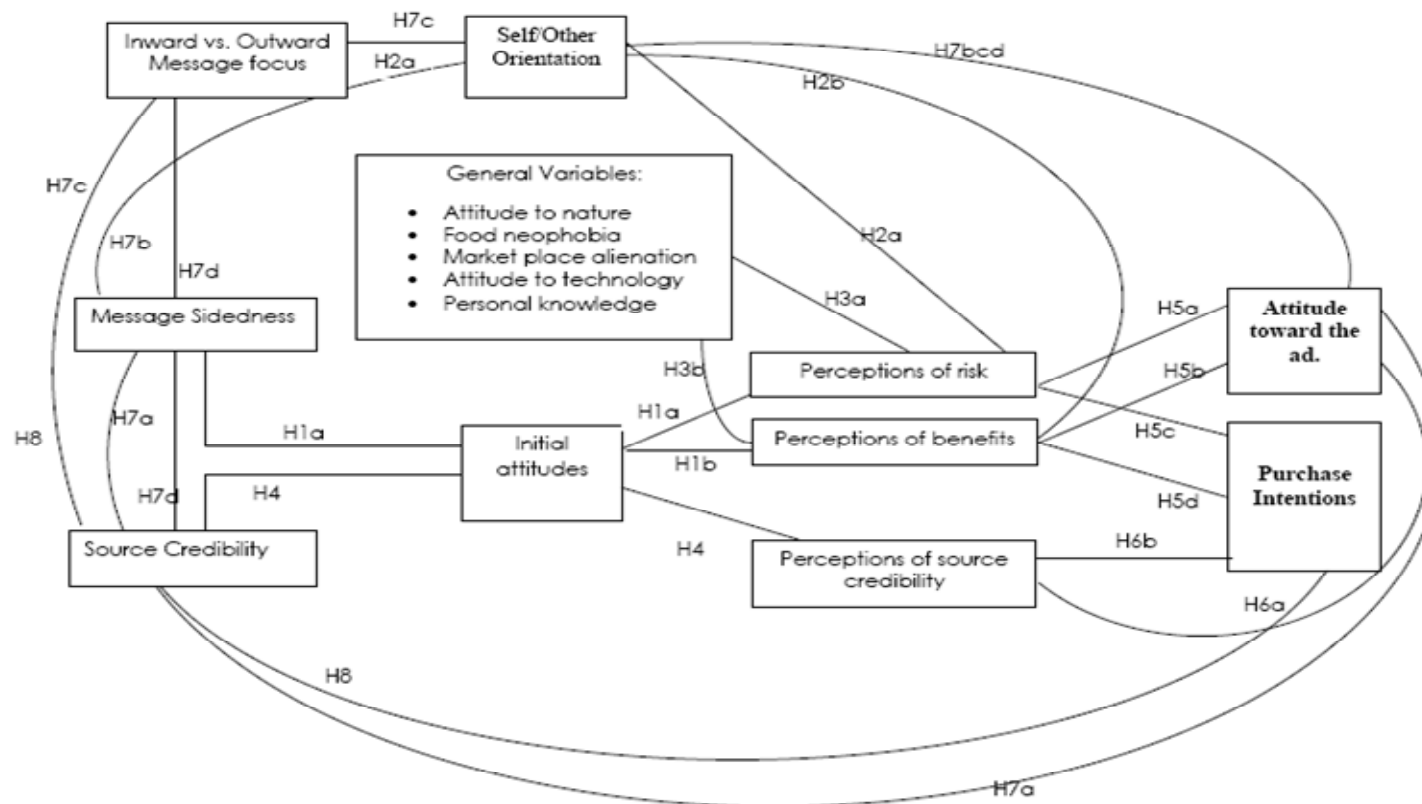


Figure 4. 3 Proposed Theoretical Model

4.3.2 The Covariate Constructs

A number of covariates were included in the model. These include *perceptions of source credibility*, *perceptions of risk and benefits*, *initial attitudes*, and *self vs. other orientation*. Each of these covariates was identified through the literature search as possible intervening variables with the potential to impact upon the persuasiveness of the independent manipulations. Their specific roles will be discussed in greater depth in the hypotheses section. Along with these variables, a number of additional covariates will be tracked although for simplicity are not shown in the model. These are *involvement*, *cognitive elaboration* and Bredahl's five determinants of attitudes towards GMFs, *attitude towards nature*, *attitude towards technology*, *food neophobia*, *personal knowledge* and *market place alienation*. Bredahl (2001) tested the influence of these five general variables on consumer perceptions of risk and benefits in a European context, while Gamble et al. (2000) included them in a New Zealand study on consumer perceptions of risks and benefits associated with GMFs. These additional variables will be tracked to see if they have any influence on *perceptions of risks* and *perceptions of benefits* and/or the outcome constructs of attitude towards the ad and purchase intentions.

4.3.3 The Outcome Constructs

Two outcome constructs, or measures of persuasiveness, are part of the conceptual model, *attitude toward the ad*. and *purchase intention*. They are both commonly used in consumer research and are appropriate measures of persuasion in this study. There are some important contextual differences between the two dependent variables however, and because of these, the analysis will not include investigating the relationship between the two. In this study Attitude toward the Ad is more indicative of true perceptions than

purchase intentions. The message recipients will see an appeal, process the information cognitively and develop attitudes towards it. The purchase intentions measure on the other hand is much more speculative, knowingly purchasing a GMF product requires in depth reading of product labels on the rear of processed food products and is not considered realistic at present. Because of these contextual differences it is not considered appropriate to investigate the relationship between the two at this time.

4.4 Research Hypotheses

This section presents the hypotheses put forward to explain the effects that the antecedent and moderating variables have on the outcome variables.

4.4.1 Hypothesis One

One long-standing effect found in the message sidedness literature is that for those initially unsupportive, a two-sided appeal has greater persuasive effects than a one-sided appeal. Two explanations have been suggested for this. Firstly, the attribution and correspondence inference theories suggest that two-sided messages enhance perceptions of source credibility and therefore persuasiveness of an appeal. Secondly, the inoculation theories suggest that two-sided messages lead to greater supportive argumentation while inhibiting counter argumentation of the claims, thereby resulting in stronger persuasion effects. H1 tests these persuasion effects by proposing that the two-sided message will decrease perceptions of risk (H1a) and increase perceptions of benefits (H1b) to a greater extent than the one sided message, particularly for those who are initially unsupportive.

H1a: For the initially unsupportive, the two-sided appeal will lower perceptions of risks to a greater extent than the one sided.

H1b: For the initially unsupportive, the two-sided appeal will raise perceptions of benefits to a greater extent than the one sided.

4.4.2 Hypothesis Two

H2 draws from the many studies that found support for using inwardly vs. outwardly focused manipulations in advertising appeals (Bonelli, 1989; Brunel & Nelson, 2000; Han & Shavitt, 1994; Jaffe, 1991, 1994; Meyers-Levy, 1998; Wang, Bristol, Mowen & Chakraborty, 2000). These studies have typically used consumer goods and results have often found persuasion effects when there is congruency between self-other orientation and inward or outward message focus. This congruency effect draws from the work of Markus and Kitayama (1991) and Cross and Madson (1997). Markus and Kitayama suggest that interdependent selves (other-oriented) will elaborate more on messages that have an outward focus than on messages with an inward focus. Independent selves (self-oriented) will elaborate more extensively on inwardly focused than on outwardly focused messages. Cross and Madson suggest that interdependent selves attend closely to, encode, organise and remember information that highlights relationships, while the same effects happen for independent selves when uniqueness and individuality are the focal point. H2 tests whether these effects are apparent in the context of a controversial social issue rather than the consumer goods more typically used, and proposes that the elaboration effects discussed above will influence perceptions of risk (H2a) and perceptions of benefits (H2b).

H2a: Congruency between inward vs. outward message and self/other orientation will lead to lower perceptions of risk than incongruency.

H2b: Congruency between inward vs. outward message and self/other orientation will lead to higher perceptions of benefits than incongruency.

4.4.3 Hypothesis Three

Bredahl (2001) found five general attitude variables impacted upon consumer perceptions of risks and benefits associated with GMFs. These five are *attitude to technology*, *attitude to nature*, *food neophobia*, *marketplace alienation* and *perceived own knowledge*. Gamble et al. (2000) using Bredahl's model suggested that New Zealand consumers view GMFs through a risk-benefit analysis and they found that *attitude to nature* had the strongest influence on both *perceived risks* and *perceived benefits* while *food neophobia* and *marketplace alienation* played a role in determining *perceived benefits* but not *perceived risks*. H3 extends Bredahl's findings by testing whether these general variables continue to influence perceptions of risks and benefits following exposure to an advertising appeal.

H3a: Perceptions of risk will be positively associated with attitude to nature, food neophobia, market place alienation and negatively associated with attitude to technology and personal knowledge.

H3b: Perceptions of benefits will be negatively associated with attitude to nature, food neophobia, market place alienation and positively associated with attitude to technology and personal knowledge.

4.4.4 Hypothesis Four

Frewer, Howard, Hedderly and Shepherd (1999) have determined that source trustworthiness is important in assessing the persuasiveness of messages relating to GM foods. Researchers including Frewer, Howard, Hedderley and Shepherd (1996) and Gamble et al. (2000) have suggested that sources vary in their level of trustworthiness,

with exploratory work suggesting that consumer groups and independent scientists can be considered trustworthy sources, while government agencies and industry groups are considered untrustworthy. Frewer, Scholderer and Bredahl (2003) found however, that the degree to which a source is considered trustworthy is largely determined by prior attitudes toward Genetic Engineering technologies. In using the source credibility manipulation, this study assumes that sources such as consumer groups are perceived as more credible than industry groups, however to test Frewer, Scholderer and Bredahl's (2003) results, it is proposed that perceptions of source credibility will be mediated by prior attitudes.

H4: The effect of the source credibility manipulation on perceptions of source credibility will be mediated by prior attitudes towards GMFs.

4.4.5 Hypothesis Five

H5 extends the work conducted by Bredahl (2001) and Frewer, Scholderer, and Bredahl (2003). Bredahl (2001) found that perceptions of benefits and risks influenced attitudes towards GM technologies, while Gamble et al. (2000) using Bredahl's model, suggested that New Zealand consumers view GMFs through a risk-benefit analysis. Neither of these studies tested the effects of exposure to information about GMFs. In a later study, Frewer, Scholderer and Bredahl (2003) provided information through either multi page brochures or one page leaflets about specific GMF products, finding that prior attitudes had the greatest influence on attitudes towards GMFs. The present study extends this previous research by testing the effects of advertising appeals on both attitudes toward the ad. and purchase intentions. Specifically, as both Bredahl (2001) and Gamble (2000) have found that perceptions of benefits and risks are important influences on attitudes, H5

proposes that perceptions of risks and benefits will directly influence both attitude toward the ad. (H5a & b) and intention to purchase GMFs (H5c & d).

H5a: Perceptions of risk will negatively influence attitudes attitude toward the ad.

H5b: Perceptions of benefits will positively influence attitudes towards the ad.

H5c: Perceptions of risk will negatively influence purchase intentions.

H5d: Perceptions of benefits will positively influence purchase intentions.

4.4.6 Hypothesis Six.

As discussed above in H4, Frewer, Howard, Hedderly and Shepherd (1999) found source trustworthiness to be an important determinant of message persuasiveness in the context of information dissemination regarding GMFs, although Frewer, Scholderer and Bredahl's (2003) results indicate that prior attitudes were of greater importance than source trustworthiness. Based on the earlier study and on the results of many studies that have found main effects for source credibility (see for example, Hovland & Weiss, 1951; Johnson & Izzett, 1968; Johnson, Torvicia & Poprick, 1968 and Kelman & Hovland, 1953; all cited in Pornpitakpan, 2004), H6 extends the findings of both the 1999 and 2003 studies by proposing that perceptions of source credibility will positively influence both attitude toward the ad. (H6a) and purchase intention (H6b).

H6a: Perceptions of source credibility will be positively associated with attitude toward the ad.

H6b: Perceptions of source credibility will be positively associated with intentions to purchase GMFs.

4.4.7 Hypotheses Seven and Eight, Interaction Effects.

Hypotheses 7 and 8 draw on the literature above to propose interaction effects between the antecedent variables on the outcome variables *attitude toward the ad.* (H7) and *purchase intentions* (H8). For *message sidedness*, interaction effects are predicted only for *attitude toward the ad.*, as past studies have shown that effects for *message sidedness* on *purchase intentions* have been difficult to achieve without the use of a correlational inference approach (Pechmann, 1993), which this study does not use.

4.4.7.1 Message Sidedness and Source credibility

As discussed in chapter one of this thesis, research conducted in New Zealand has found that the risk factors associated with GMFs tend to predominate consumer thinking about these products and consequently overall purchase intentions remain low. As many message sidedness studies using the correspondent inference effect have found, two-sided messages are associated with greater effectiveness than one-sided in contexts where opposition is evident, because they are associated with greater source credibility. Based on this relationship, H8a proposes that the two antecedents, message sidedness and source credibility, will interact so that the two-sided, highly credible messages will produce greater persuasion effects than either the one-sided, highly credible message or the two sided, low credibility message.

H7a: Attitude toward the ad. will be more positive when the message is both two-sided and highly credible, than when it is either one-sided and highly credible or two-sided with low credibility.

4.4.7.2 Message Sidedness and Inward vs. Outward Message Focus

As discussed in H2, studies have found persuasion effects for inward vs. outward message focus when congruency exists between an individual's self-other orientation and

the inward or outward focus of the message, and both Markus and Kitayama (1991) and Cross and Madson (1997) suggest that this is due to increased cognitive effort. According to the ELM this leads to central route processing, resulting in greater and more durable persuasion effects. To our knowledge, no studies have measured the effects of including both inward vs. outward message focus and message sidedness and therefore interaction effects between the two are difficult to predict. However, using Markus and Kitayama's (1991) and Cross and Madson's (1997) explanations, as well as the inoculation theory expectation that the two-sided message should give rise to greater supportive message elaboration than the one-sided, increases in central route processing can be expected and interaction effects for attitude toward the ad. proposed. The additional cognitive effort involved in positively interpreting an appeal which is both two-sided and has congruency will give rise to increasingly positive attitudes toward the ad when the message is both two-sided and there is congruency between inward-outward message focus and self-other orientation.

H7b: Attitude toward the ad. will be more positive when the message is both two-sided and there is congruency between inward vs. outward message focus and self-other orientation, than when it is either one-sided with congruency, or two-sided and incongruent.

4.4.7.3 Inward vs. Outward Message Focus and Source Credibility

As with the discussion preceding H7b above, no studies were sourced which measured the combined persuasive effects of inward vs. outward message focus and source credibility, however once again the ELM allows us to make predictions for interaction effects between these two antecedents, given the multiple roles assigned to source credibility. In conditions of high involvement, high source credibility is known to induce

greater and more positive argument elaboration, (Andrews & Shimp, 1990; Homer & Kahle, 1990; Chaiken & Maheswaran, 1994) leading to central route processing and increased, longer lasting persuasion effects. When combined with the greater elaboration resulting from congruency between inward vs. outward message focus and self-other orientation, interaction effects can be expected so that with high involvement, both attitudes towards the ad(H7c) and purchase intentions (H8) will become increasingly positive when the message uses both a highly credible source and there is congruency between inward vs. outward message focus and self-other orientation.

H7c: When there is high involvement, attitudes toward the ad will be more positive when both a highly credible source is used and there is congruency between inward vs. outward message focus and self-other orientation, than when either a highly credible source is used and there is incongruency, or a low credibility source is used and the message is congruent.

Based on the foregoing discussions, a three-way interaction between the antecedents is also proposed for attitude toward the ad. However, as discussed above, purchase intention effects for message sidedness are difficult to achieve and therefore no three-way interaction for purchase intentions is proposed. H8 outlines a two-way interaction for inward vs. outward message focus and source credibility for purchase intentions.

H7d: Attitudes toward the ad will be most positive when the message is two-sided, there is congruency between inward vs. outward message focus and self-other orientation and it has high source credibility.

H8: When there is high involvement, purchase intentions will be more positive when both a highly credible source is used and there is congruency between inward vs. outward message focus and self-other orientation, than when either a highly credible source is used and there is incongruency, or a low credibility source is used and the message is congruent.

4.5 Chapter Summary

This chapter has introduced the theoretical model on which the study is based, discussed the relationships outlined in the model and presented the hypotheses developed for testing. Building upon this work, chapter five outlines the research methodologies applied to the study.

Chapter Five

Research Methodology

5.1 Introduction

Chapter five outlines the research methodology employed for the study. Specifically, it discusses the experimental design used to test the hypotheses presented in chapter four. Chapter five begins with a discussion of the experimental design, including the procedures involved with the development of the online research site and the stimulus material. It then details the pre-test of the stimulus material, the procedures for recruiting a sample for the main study and finally, the development of the questionnaire.

5.2 Experimental Design

The study used a 2x2x2 between subjects factorial design with three variables, (*message sidedness*, *source credibility* and *inward vs. outward message focus*) manipulated on two levels, *one or two- sided message*, *high or low source credibility* and *inward or outward message focus*, to produce eight experimental conditions as illustrated in figure 5.1.

The stimulus material reflected eight different combinations of advertising appeals resulting from manipulations of the independent variables. Based on the findings from the focus groups it was decided that the appeals designed for the experiment would

promote the general issue of Genetic Engineering (or modification) rather than specific GMF products as it was thought that advertising appeals promoting specific GMFs may appear unrealistic.

In order to conceal the true purpose of the study, the targeted appeals were embedded within a research project purporting to collect data on opinions for a variety of social issues. Three dummy advertising appeals were constructed along with the target messages, and these included an appeal supporting the prevention of drink driving, an anti-smoking message and a message about HIV/Aids prevention.

		Message Sidedness			
		two-sided	one-sided		
Source Credibility	high	Cond. One	Cond. Two	Outward	Inward vs. Outward message focus
	low	Cond. Four	Cond. Three		
	high	Cond. Seven	Cond. Five	Inward	
	Low	Cond. Eight	Cond. Six		

Figure 5. 1: Experimental conditions

Subjects were shown all four advertising appeals twice in the same order. Firstly, they viewed the appeal against drink driving, secondly the target appeal, thirdly the anti smoking message and finally the appeal for HIV/Aids prevention. The target advertisement was shown one further time directly before completion of the questionnaire. The intent in showing the appeal a third time directly before the

questionnaire was to promote a recency effect (Haugtvedt and Wegener, 1994, Duncan and Murdoch 2000). All of the advertising appeals were designed specifically for the experiment, and all but the target appeal used elements from previous poster and website campaigns. The appeals were constructed using *Macromedia flash 2004* to ensure that a professional standard of graphic and textual elements were included.

5.3 Stimulus Material

A copy of the target advertising appeals making up the stimulus material is included in appendix one and a discussion of each of the treatment manipulations appears below.

5.3.1 Message Sidedness

The target appeals were constructed using either a one-sided or two-sided refutational message. In the one-sided conditions, the text read as follows:

GE combines the best of two species.
GE food, better nutrition, pesticide free and safe
for you [for all]).

In this message, the attributes of Genetic Engineering are shown as positive, progressive and healthy, and as providing a means to nutritious, chemically free foods. As discussed in chapter three, the benefits of better nutrition and being pesticide free were chosen because the focus group participants considered them to be both beneficial and important. The benefit of safety was also included as it helped refute the negative element used in the two-sided message.

In the two-sided condition, a negative element was introduced and then refuted. The negative element chosen was unnaturalness, considered by the focus groups to be an important risk associated with GMFs. Rather than directly discussing this element, a metaphorical approach was used whereby the foods were associated with the monster Frankenstein. This metaphor has the advantage of conveying the element of unnaturalness in a manner that is consistent with increased danger and risk, has been widely used in media accounts of genetic engineering technologies, and is therefore relatively well known and considered appropriate to use. The text of the two-sided message read as follows:

GE combines the best of two species.

Some people think GE is playing Frankenstein with their food

But nature's been mixing it up for centuries.

GE food, better nutrition, pesticide free and safe

for you [for all].

The second line conveys the negative element while the third and fourth line provide the refutation. The reference to the fact that hybridisation of genetic material has occurred throughout history, and is a natural part of life, helped refute the unnaturalness associated with the Frankenstein metaphor. In addition, by including the term “safe” in the list of positive statements about genetic engineering, an attempt was made to decrease the perception of danger and risk.

The two-sided message followed the refutational approach suggested by Crowley and Hoyer's (1994) integrative framework. Other suggestions that form part of the

framework and included in this message were: early (but not first) presentation of the negative element, use of moderately important negative elements, and the amount of negative information presented was less than the suggested 40% maximum (one negative element and three positive elements).

5.3.2 Source Credibility

The high and low source credibility manipulations were based on the work of Frewer et al. (1996, 1999) and Gamble and Gunson (2002). Frewer et al. investigated the credibility of sources endorsing new food practices, and Gamble and Gunson focused on source credibility in the context of GMFs. Their results suggest that credible sources in this context include independent organisations such as consumer groups and university scientists, while non-credible sources include industry groups and the government. Based on these findings, the high credibility manipulation used a fictitious consumer group as a sponsor, the *Consumer Protection Association* and this name and logo appeared at the bottom of each page of the high credibility messages. The last page of the appeal included a photograph of a male actor wearing a white coat holding a clipboard and standing in front of bins of fruit and vegetables at the supermarket to act as a spokesperson for the Consumer Protection Association. The sponsor in the low credibility conditions was a fictitious industry group, the *Biotechnology Industry Association*, and on each page of the low credibility appeals this name and logo appeared at the bottom of the message. On the final page, as a sponsor, the same actor was again included as a spokesperson and portrayed as wearing a suit and tie, sitting at a business desk crowded with papers.

5.3.3 Inward vs. Outward Message Focus

The third manipulation, inward vs. outward message focus, was designed to test whether reference to either an inwardly focused or an outwardly focused message would increase the persuasion of the communication. The image used for the inward orientation was of a single person (photographed from the back and therefore of indeterminate sex and ethnicity) running through a park. This image intended to portray a message of independence, self-reliance individualism and autonomy, characteristics associated with an inward orientation (self). As the image appeared, the text read “*for you*” to convey the idea that the benefits associated with GMFs were specific to the subject viewing the appeal. The image used for the outward focus was of a large group of people at a public festival or concert sitting on blankets or low chairs, enjoying the sun and entertainment. This scene was intended to be associated with feelings of community, interdependence, interpersonal relationships and concern for others, characteristics associated with an outward orientation (others). As the scene appeared on the screen, the text read “*for all*” conveying the impression that the benefits of GMFs were for all members of the community.

Before finalising the experimental design, checks were performed on each of the manipulations to ensure that sufficient variations between the conditions were actually perceived as such by participants. A questionnaire was sent online to a convenience sample (N=60), asking them to rate the experimental manipulations on a series of likert type scales. 45 responses were received in total, of which 43 were usable and two were discarded due to high levels of missing data. The results of the manipulation checks were analysed using one-sample t-tests to assess whether significant mean differences could be

observed between each of the two levels of manipulation. A copy of the full manipulation check questionnaire is included in appendix two.

5.3.4 Pre-test Manipulation Checks

5.3.4.1 Source Credibility

The source credibility manipulation was pre-tested using one item from the 9 point scale from Lichtenstein and Beardon (1988). Participants were asked to imagine that they saw an advertising message for a food product such as milk or bread, and they were then shown the high credibility endorser, *Consumer Protection Association* and asked to rate how credible they felt that endorser might be. They were then asked to suppose they saw the same advertising message, and this time were shown the endorsement made by the low credibility source, the *Biotechnology Industry Association*. They were then requested to rate the second endorser as in the first scenario.

5.3.4.2 Inward vs. Outward Message Focus

None of the published scales examined could suitably act as a manipulation check for this pre-test as many of the scales found in the literature used either a femininity vs. masculinity, or an individualistic vs. collectivist approach which did not suit the purpose of this study. Ten items sourced directly from the literature and descriptive of either an inward or an outward focus were compiled specifically for this pre-test. These descriptive terms with their sources are described below:

- *extremely communal(5) –not communal at all(1)*(Bakan, 1966; Meyers-Levy, 1988; Markus & Oyserman, 1989; Hupfer, 2002)

- *completely self reliant(1) – not self reliant at all(5)* (Wang, Bristol & Chakraborty, 2000; Hupfer, 2002)
- *completely autonomous(1) - not autonomous at all(5)* (Gilligan, 1982; Markus and Oyserman, 1987; Markus & Kitayama, 1991; Cross & Madson, 1997; Wang, Bristol & Chakraborty, 2000)
- *extremely interdependent(5) – not interdependent at all(1)* (Markus and Oyserman, 1987; Markus & Kitayama, 1991; Aaker & Williams, 1998)
- *completely separate(1) – not separate at all(5)* (Chodorow, 1978; Gilligan, 1982; Markus & Oyserman, 1989; Markus & Kitayama, 1991; Cross & Madson, 1997)
- *extremely individualist(1) – not individualist at all(5)* (Carlson, 1971; Markus & Oyserman, 1989)
- *extremely suggestive of interpersonal relationships(5)- not suggestive of interpersonal relationships at all(1)* (Carlson, 1971, 1972; Markus and Oyserman, 1989; Aaker & Williams, 1998)
- *extremely suggestive of concern for others(5) - not suggestive of concern for others at all(1)* (Meyers-Levy, 1988, 1989; Jensen, McGhie & Jensen, 1991; Cross & Madson, 1997)
- *extremely suggestive of concern for self(1) –not suggestive of concern for self at all(5)* (Meyers-Levy, 1988, 1989; Cross & Madson, 1997)
- *completely suggestive of independence(1)-not suggestive of independence at all(5)* (Markus & Oyserman, 1987; Cross & Madson, 1997, Hupfer, 2002).

Participants were first shown the outwardly focused followed by the inwardly focused image and asked to rate how suggestive that image was on each of the ten items. The

scale was constructed so that high scores equated to an increasingly outward focus, and low scores to an increasingly inward focus.

5.3.4.3 Message Sidedness

A search through the literature showed that manipulation checks on message sidedness effects routinely use scale items that are specifically composed for the context of individual studies. This is because each two-sided message manipulates different elements and therefore standardised scales would be ineffective in detecting the success of the manipulation. In this pre-test, the manipulation was performed in two stages. Participants were first given the one-sided message, followed by the two-sided message and asked to identify the number of negatively phrased and positively phrased statements. Then they were asked to rate on nine point scale items whether the advertising message attempted to acknowledge concerns that people may have regarding GE foods, and whether the statements attempted to deal with the issues that members of the public may have.

5.3.5 Pre-test Results

5.3.5.1 Scale Reliabilities

Scale reliabilities were not calculated for the source credibility scale, nor for the message sidedness concern and issues items, and numbers of positive and negative statements, as these were one item measures. The Inward vs. Outward message manipulation items were compiled specifically for this test and descriptive statistics along with measures of reliability were calculated, as reported in table 5.1 below.

Table 5. 1: Descriptive statistics for the self vs. others scale items.

	<i>Mean Self Manip.</i>	<i>Std Dev Self Manip.</i>	<i>Mean Other Manip</i>	<i>Std Dev Other Manip.</i>
<i>Communal</i>	1.28	0.74	3.83	1.28
<i>Self Reliant</i>	1.35	0.93	3.09	1.30
<i>Autonomous</i>	1.52	1.06	3.28	1.25
<i>Interdependent</i>	1.80	1.41	3.45	0.99
<i>Separate</i>	1.73	1.06	3.61	1.36
<i>Individualist</i>	1.21	0.78	3.76	1.20
<i>Interpersonal Relationships</i>	1.26	0.62	3.73	1.32
<i>Concern for Self</i>	1.60	0.93	3.09	1.22
<i>Concern for Others</i>	1.50	0.83	2.73	1.14
<i>Independence</i>	1.30	0.89	3.19	1.32
<i>Total 10 item scale</i>	1.45	0.50	3.38	0.75
<i>Cronbach's alpha</i>	.72		.80	
<i>Cronbach's alpha after optimisation</i>	.78		.81	

Reflecting on the pre-test results it was felt that the inclusion of the two terms 'independent' and 'interdependent' may lead to confusion for participants involved in the main study. Further analysis indicated that the reliability statistics for the overall scale could be improved by the deletion of the item *interdependence*. Without this item, the Cronbach's alpha score for the remaining nine items increased to .78 for the self and .81 for the other condition and the decision was therefore made to use only the remaining nine items in the final study.

5.3.5.2 Manipulation Checks

To analyse the results from the pre-test manipulation checks, descriptive statistics were calculated for all items and tests of statistical significance were conducted via one-sample student t-tests. Table 5.2 displays these results.

All manipulations were deemed successful as significant differences were found between each of the treatment means. However, it was felt that changes needed to be made to each scale, to improve the measurement of the manipulations in the main study. Firstly, it was decided that the source credibility manipulation would be measured by Lichtenstein and Beardon's (1988) full four item scale to gain greater scale reliability.

Table 5.2: descriptive statistics for the manipulation checks

<i>Manipulation</i>	<i>Mean (\bar{X}) value</i>	<i>Std Dev.</i>	<i>T.</i>	<i>Sig.</i>
High credibility	6.13	2.04	19.71	p =<0.001
Low credibility	4.65	1.79	16.96	
Outward focus manipulation	1.45	0.75	28.95	p =<0.001
Inward focus manipulation	3.38	0.50	18.70	
One-sided (positive statements)	2.81	1.38	2.81	p =<0.001
Two-sided (positive statements)	3.23	1.41	3.23	
One-sided (negative statements)	0.65	0.70	5.93	p =<0.001
Two-sided (negative statements)	1.74	1.00	11.41	
One-sided issues and concerns	4.91	2.42	11.08	p = <0.01
Two-sided issues and concerns	5.11	1.75	16.01	

Secondly, for the inward vs. outward message manipulation, the deletion of the interdependence item improved the reliability of the scale and therefore only the remaining nine items were used in the main study. Finally, even though satisfactory results were obtained using the message sidedness manipulation check, two problems arose. Firstly, participants in the pre-test identified negative statements in the one-sided message as well as in the two-sided message, when in fact the one-sided statement contained only positive statements. Secondly, thirteen of the forty-three participants did not answer the question relating to issues and concerns for the one or the two-sided message, an unacceptably high number. The high number of non responses to the issues

and concern questions, and the fact that participants identified negative statements in the one-sided measure, indicated that these items were poor measures of the message sidedness manipulation, and a new measure was designed as a replacement, this is reported on in more detail in the questionnaire development section below.

5.4 Experimental Procedure

5.4.1 Recruitment of Participants

In order to achieve enough power for analysis of an eight cell design, a target minimum of 40 participants was required for each condition. Using a list of random numbers generated through *Microsoft Excel 2003*, a sample of 4000 New Zealanders aged 18 and over was chosen from the general electoral roll and in February and March 2005, letters were sent by mail inviting the sample to take part in the study. It was expected that not all letter recipients would have ready access to the internet and therefore a targeted response rate of 10% was deemed realistic. The letter directed potential participants to the research website from which they could elect to complete the study if they so wished. To encourage participation, an incentive consisting of a chance to win one of 10 prizes consisting of mobile phone cards to the value of \$40 each was offered.

5.4.2 Online Experiment Website Design

The research study website was constructed using *Microsoft Frontpage 2002* and consisted of six pages excluding the messages themselves, a copy of each of these pages is included in appendix three and a brief explanation of each page follows.

The site started with an introductory page, which welcomed participants to the study. From this page participants linked to an explanatory page briefly describing the study's purpose as research into New Zealander's thoughts on a range of current social issues. This page also gave contact details, consent information, details about the length of time the study would take, and information about the prize draw. From the explanatory page and prior to exposure to the experimental manipulations, participants accessed an initial questionnaire, which tracked opinions towards GMF foods. To maintain the experimental cover, questions were also asked about the three other social issues, drink driving, smoking and HIV/Aids prevention, however while this information was recorded it was not included in the data analysis. Once the initial questionnaire was completed, participants clicked a link and accessed the four messages for the first time. The order in which the appeals were shown remained consistent as detailed in the experimental design section. Participants were then given a brief paragraph about each of the issues, and shown the messages for the second time. Finally, the participants were told that they would be asked to complete a questionnaire on one of the advertisements and clicked a link through to the target message for a third viewing before accessing the main questionnaire.

In order to control the flow of the experiment, the navigational toolbars on each subject's web browser were deactivated until they finished the experiment and no options to "go back" were offered after the explanatory page. In both the initial and final questionnaires, subjects gave their opinions and completed their demographic data by using text boxes, drop down menus and radio buttons. The development of the

questionnaires used in this study is outlined next and a copy of each can be found in appendix four.

5.4.3 Questionnaire Development

There were two questionnaires included in this study. The first was used to track initial attitudes towards GMFs prior to exposure to the experimental manipulations and the second was the main questionnaire. This second questionnaire consisted of four sections, broken up by bookmarked links, so that it would not appear too long for participants. The questions were based on the constructs outlined in the theoretical model and included in the last section were questions designed to record demographic information and to assist in interpreting the results. The measurement scales used for each of the constructs are detailed next.

5.4.3.1 Initial Questionnaire

Initial Attitudes

The measures were based on those used by Bredahl (2001) and consisted of three items. The first two asked subjects for their response to the question, *applying gene technology to food production is:* with the answers being rated on a seven point scale anchored by *extremely bad(1) - extremely good (7)*, and *extremely wise(7) - extremely foolish(1)*. The third item asked for a rating to the question, *I am; strongly against(1) - strongly for(7) applying gene technology to food production*, again rated on 7 points.

5.4.3.2 Main Questionnaire - Independent variables

Source Credibility

Source credibility was measured with a four item, nine-point scale from Lichtenstein and Beardon (1988). The scale asks participants to rate the message source as *insincere (1)-*

sincere(9), dependable(9) - not dependable(1), trustworthy(9) - not trustworthy(1) and not credible (1) - extremely credible(9).

Inward vs. Outward Message Focus

This item was measured using a nine item, nine-point scale designed specifically for the study with the items constructed so that lower values equated to inward focus and higher values equated to an outward focus. The scale items with their sources are detailed in section 5.2.4.2 above.

Message Sidedness

As detailed in section 5.2.5.2, the scales used in the pre-test as a message sidedness manipulation check were not considered appropriate to use in the main study. Recent advertising appeal research using a message sided approach has relied on manipulation checks that ask participants to evaluate how the positive and negative attributes are used within the appeal, (see for example, Bohner, Einwiller, Erb & Seibler, 2003; Pechmann, 1992). Following this approach, a further item was developed specifically for the final experiment which asked participants to evaluate how important the refutation was in addressing the concerns raised by the negative elements. The item was: *To address concerns regarding Frankenstein foods, to what extent does the advertisement use a message relating to nature mixing things up?* This question was anchored by *Not at all (1) -To a great extent (7)*.

5.4.3.3 Main Questionnaire – Dependent variables

Attitude Toward the Advertisement

This measure was based on the scale developed by Mitchell and Olson (1981). The scale asks subjects to rate on a seven point, four item scale, their opinion of the advertisement

anchored by, *good(7) – bad(1)*, *liked(7) – disliked(1)*, *interesting(7) – not interesting(1)*, *irritating(1) – not irritating(7)*.

Purchase Intention

The scale used was developed by Bredahl, (2001) specifically for determining subject's intentions to purchase GMFs. The scale measures general intentions toward the purchase of GE foods, rather than intentions to purchase specific products. The scale consists of three questions, four items, and is rated on 7 points. Item one; *If GE foods were available in shops, I would intend to; Definitely avoid them (1) – Definitely buy them (7)*. Items two and three; *The idea of purchasing GE foods is, Extremely bad (1) – Extremely good(7), Extremely pleasant(7) – Extremely unpleasant(1)* and item four, *I am; Strongly for(7) – Strongly against(1) buying GE foods*.

5.4.3.4 Main Questionnaire - Covariate Measures

Cognitive Elaboration Measures

Two measures were used to assess the cognitive elaboration of participants. Firstly, question one asked participants to write down all the thoughts they had about the advertisement within two minutes. Unfortunately, because the study was conducted online, it was not possible to control the time period that participants took, but they were asked to self monitor and to move on to the next question after two minutes. This self reported thought-listing approach is used extensively in the message sidedness literature and is an appropriate way to measure cognitive responses in this context. See for example, Belch (1981), Kamins and Assael (1987), Hastak and Park (1990) and Bohner, Einwiller, Erb and Seibler (2003)

Because of the limitations of controlling the time that participants took to complete the thought listing task, a second measure of cognitive elaboration was included to increase validity. Based on the scales used by Bohner et al. (2003), two seven-point Likert type scales asked subjects to rate how *intensely* they examined the advertisement as well as how *carefully* they read the appeal. The scales were anchored by *not intensely at all (1)*, *very intensely (7)* and *not carefully at all(1)*, *very carefully(7)*.

Self vs. Other Orientation

This measure was taken from the connectedness-separateness scale used by Wang, Bristol, Mowen and Chakraborty (2000). Two of the three dimensions were chosen, *self-other (relationship)* and *self-other (dependence)*. The third, *self-other (association)* is normally used in cross cultural applications and was not thought of as appropriate for this study. The self-other orientation (relationship) and (dependence) scale has a total of 10 items, rated on five points anchored by strongly disagree (1)-strongly agree (5). The items for the dependence dimension were:

- *A person should be independent from others, even with his friends or family members;*
- *Keeping my independence and autonomy is most important in my relationships;*
- *I like to solve my personal problems myself even if someone else could help me;*
- *I prefer to make my own decisions most of the time.*

The scale items for the relationship dimension are as follows;

- *When I describe myself, I also mention those who are important to me as if they were part of myself;*
- *I consider those people who are closely related to me as part of myself;*

- *Among my most intimate family members and close friends, we share our personal experiences;*
- *I find that I easily experience other people's feelings as my own feelings;*
- *A good relationship consists of people who enjoy being together;*
- *I make most of my personal decisions jointly with other family members or close friends..*

The five general attitude measures, *attitude to nature*, *attitude to technology*, *food neophobia*, *marketplace alienation* and *personal knowledge* as well as *perceived benefits* and *perceived risks*, were all adapted from Bredahl (2001). As outlined in chapter four, the five general measures were found by Gamble (2000) and Bredahl (2001) to influence perceptions of the benefits and risks, which in turn influenced attitude toward GE technologies. These five general variables, along with perceptions of benefits and risks, were tracked in this study to determine if they influence perceptions of risks and benefits following exposure to an advertising appeal. The measures all used five point Likert type scales anchored by *strongly disagree(1)* – *strongly agree(5)*, (reverse scores are indicated).

Attitude to Nature

The six *attitude to nature* measures were:

- *The balance of nature is very delicate and easily upset by human activities;*
- *The earth is like a spaceship with only limited resources;*
- *Plants and animals do not exist primarily to be used by humans,*
- *Modifying the environment for human use seldom causes serious problems*
(reverse scored);

- *There are no limits to growth for countries like New Zealand (reverse scored);*
- *Mankind was created to rule over the rest of nature (reverse scored).*

Attitude to Technology

The five items used to measure *attitude to technology* were:

- *The degree of civilization of a people can be measured from the degree of its technological advancement;*
- *New technological inventions and applications make up the driving force of the progress of society;*
- *In New Zealand, we are probably better off than ever thanks to the tremendous progress in technology;*
- *Throughout the ages, technological know how has been the most important weapon in the struggle for life;*
- *Because of the development of technology we will be able to face up to the problems of tomorrow's society.*

Food Neophobia

The five items for food neophobia were:

- *I am constantly sampling new and different foods (reverse scored);*
- *I don't trust new foods;*
- *If I don't know what a food is I won't try it;*
- *I am afraid to eat things I have never had before; I will eat almost anything (reverse scored)*

Market Place Alienation

The five items for marketplace alienation were as follows:

- *Most companies are responsive to the demands of the consumer;*
- *Unethical practices are widespread throughout business;*
- *Stores do not care why people buy their products just as long as they make a profit;*
- *Harmful characteristics of a product are often kept from the consumer;*
- *Most claims of product quality are true (reverse scored).*

Personal Knowledge

One item was used for the personal knowledge measure: *I personally am very knowledgeable about the use of gene technology in food production.*

Perceived Benefits

The scale for perception of the benefits included eight items, all measured on five points anchored by *strongly disagree (1) - strongly agree (5)*. The items were;

- *Genetically modified food products will improve the standard of living for future generations;*
- *Genetically engineered food products are healthier than other food products;*
- *Genetically engineered food products are better quality food stuffs than other food products;*
- *Applying gene technology in food production will increase the product choice in supermarkets;*
- *Applying gene technology in food products can be used to solve environmental problems;*
- *Applying gene technology in food products will reduce the price of food products;*
- *Applying gene technology in food production is a necessary activity.*

Perceived Risks

The items used to measure perceived risks were:

- *Genetically engineered food products will cause allergy in human beings;*
- *Genetically engineered food products are a threat to human health;*
- *Applying gene technology in food production will cause environmental hazards;*
- *Genetically engineered organisms are likely to interfere with wild species in nature;*
- *Nobody knows the long term consequences on the environment and human health of applying gene technology in food production;*
- *Applying gene technology in food production will only benefit the producer;*
- *Applying gene technology in food production is unnatural*

Involvement

The involvement construct was measured with seven items taken from Zaichowsky's (1985) Personal Involvement Inventory (PII) (Enduring) scale as reported in Bruner & Hensel (1994). The seven measures selected were based on contextual fit to the question, *I think the use of Genetic Engineering in food production is*; and were measured on seven points. The items were, *important(7) – unimportant(1)*, *of concern to me(7) – of no concern to me(1)*, *valuable(7) – worthless(1)*, *beneficial(7) – not beneficial(1)*, *essential(7) – not essential(1)*, *undesirable(1) – desirable(7)*, *not needed(1) – needed(7)*.

5.5 Chapter Conclusion

The required changes to the scale items measuring the independent variable manipulations were made and the study was ready to run in February 2005. Before proceeding with the study, checks were made to see if approval needed to be sought from the University of Canterbury's Human Ethics Committee. As the questionnaire and experimental design assured the participants of anonymity, approval was not required. Data collection therefore commenced on the 8th of February 2005 and was completed in eight weeks. The following chapter, chapter six, discusses the analysis and results of the data collection.

Chapter Six

Results

6.1 Introduction

The aim of this chapter is to present the results of the statistical analysis of the data collected. To achieve this, the chapter is structured around four sections. Section one begins with an overview of the characteristics of the sample used. Section two details the analyses relating to the scales used in the online questionnaire and includes tests for dimensionality, reliability and normality. Section three discusses the effectiveness of the experimental manipulations and section four examines the hypotheses initially introduced in chapter four. Chapter seven then follows with a discussion of the major findings and research implications of the results.

6.2 Sample Size & Composition

A national mailout was launched on 8 February 2005 to recruit participants for the experimental study. To avoid overloading the web server, mailouts were spread over several dates as outlined in Table 6.1.

Table 6.1 Invitation mail out dates

<i>Date</i>	<i>Numbers of letters</i>
08/02/05	2000
15/02/05	989
22/02/05	1000
09/03/2005	500
Total	4489

A total of 4,489 letters were sent out, with 322 returned as undeliverable, resulting in a total sample size of 4,167. The experiment remained open until 8 April 2005, eight weeks in total and four weeks from the date of final mailing. At the end of this time, 399 questionnaires were received, generating an overall response rate of 9.57%. While this figure appears low, Internet access is not universal in New Zealand with only 62.5% of the population being connected (Internet Society of New Zealand, 2005) and therefore, the adjusted response rate is probably closer to around 15.25%. Also, because this study uses the experimental method, this is actually quite a good outcome as the objective was not to obtain a truly representative sample of the New Zealand population, but to get a wider cross-section than a convenience sample approach. Of the 399 participants, 19 were removed due to excessive missing data, that is, over 50% of the data values were missing, leaving 380 questionnaires suitable for inclusion in the final sample.

Before starting the data analysis, the raw dataset was examined for missing values, abnormal distribution and outliers. The distribution of each of the scales fell within an acceptable range of normality, with skewness and kurtosis statistics ranging between -2 and 2 for each scale. No outliers were discovered. As none of the scale items was found

to have missing values in more than 5% of cases, a mean replacement procedure was implemented to remove missing values, a method recommended by Hair, Anderson, Tatham and Black (1998).

Analyses were undertaken to examine the demographic characteristics of the sample and comparisons made to the general characteristics of the New Zealand population using census data from Statistics New Zealand (2005). The sample was split as 60.8% female, and 38.9% male, a slight over representation of females who make up 55% of the general population. In terms of the sample's age distribution, 29% were under 34, 49.8% between 35-54, and 21.2% were 55 and over. These results indicate an over representation of the 18-34 and 35-44 age groups and an under representation of the over 55's. 26.7% of respondents had a primary or high school education, 30% a polytechnic or trade certificate, 27.1% an undergraduate degree and 16.8% had a postgraduate degree. The sample was therefore more highly educated than the New Zealand population as a whole, in which 69% have a high school or less education, 17.4% a trade or polytechnic certificate, 4% a bachelors degree and 1.2% a post graduate qualification. Main urban centres were slightly over represented, and in terms of household income, well over half indicated they received an average or above average income (\$39,588 per annum), with 57% earning \$45,000 or greater.

6.3 Scale Structure and Reliability

All multi-item scales used in this study were examined for dimensionality, non-normality using tests for skewness and kurtosis and optimized for reliability. Results are discussed

below in separate sections for the independent, covariate and dependent variables, while means and standard deviations for each scale are reported in table 6.2.

6.3.1 Independent Variables

Three scales were used to measure the effectiveness of the treatment manipulations and served as manipulation checks. As explained in chapter five, the scale designed to measure the effectiveness of the message sidedness manipulations was a single item measure. The remaining scales used to measure inward vs. outward focus, and source credibility were multi-item measures and were checked for dimensionality, reliability and normality. These results are explained below

6.3.1.1 Dimensionality

Dimensionality was examined using principal components analysis (with varimax rotation). The scale used to measure the source credibility manipulation was found to be uni-dimensional, while that used to measure the effectiveness of the inward vs. outward message manipulation produced two highly correlated factors, labelled here as independence and interdependence factors. The scale consisted of nine items and was treated as having two distinct dimensions, with six items comprising dimension one (labelled as independence factors) and three items comprising dimension two (labelled as interdependent factors). The independence and interdependence factors accounted for 29.20% and 18.10% of the variance respectively. After adjusting for satisfactory reliability (see below), a finalised five item scale using only the independent factors (and therefore uni-dimensional) explained 52.20% of the variance, acceptable, according to Diekhoff (1992).

6.3.1.2 Reliability

Subsequent to the principle components analysis, the multi-item scales were assessed for reliability using Cronbach's alpha. The source credibility scale showed a good level of reliability ($\alpha = 0.83$) while the independent dimension of the inward vs. outward message focus was optimised for reliability, ($\alpha = >0.76$) by removing the *concern for self* item from the scale and resulting in a five item scale. For the interdependent items, the scale was unstable and could not be optimised for satisfactory reliability ($\alpha = >0.59$) and therefore was not used for further analysis.

6.3.1.3 Normality

The skewness and kurtosis levels reported in table 6.2 fell within acceptable ranges of (-1, 1) for skewness (Hair et al, 1998) and (-2, 2) for kurtosis levels Morgan (1988). These levels are considered satisfactory for the assumption of normal distribution to apply.

6.3.2 Dependant Variables

6.3.2.1 Dimensionality

Using principal components analysis, the dependent measures for attitude toward the ad and purchase intention were found to be uni-dimensional

6.3.2.2 Reliability

The reliability levels of both dependent variables were above the minimum threshold of $\alpha = >0.70$ and were therefore considered satisfactory

6.3.2.3 Normality

The skewness and kurtosis levels reported in table 6.2 fell within acceptable ranges of (-1, 1) for skewness (Hair et al, 1998) and (-2, 2) for kurtosis levels. These levels are considered satisfactory for the assumption of normal distribution to apply.

6.3.3 Covariates

6.3.3.1 Dimensionality

Again using principal components analysis two covariate scales produced two factors. The first of these, the involvement scale had one item (*unimportant – important*), which produced mixed loadings. This item was deleted to create one factor. The scale for attitude to nature also produced two factors, however deletion of item e, *there are no limits to growth for countries such as New Zealand*, reduced this scale to one factor.

6.3.3.2 Reliability

Four covariate scales produced reliability scores below the acceptable level ($\alpha > .70$), and included cognitive elaboration, self-other orientation (relationship) dimension, attitude to nature and market place alienation. As the cognitive elaboration scale contained two items only, the reliability measure could not be improved. Similarly, none of the other three scales could be altered with the deletion of any item and therefore results derived from these scales could possibly be unstable.

6.3.3.3 Normality

None of the covariate scales showed unsatisfactory skewness and kurtosis levels and therefore all were considered to be distributed normally.

6.4 Manipulation Checks

As explained in the research methodology chapter, this study consists of a factorial design experiment, with three independent variables manipulated on two levels each, (one/two-sided message, high/low credibility and inward vs. outward focus). To ensure subjects successfully perceived these manipulations, a check using one-way ANOVA was carried out using the scales outlined in the research methodology chapter. Tables 6.3, 6.4 and 6.5 present the mean scores and standard deviations for the scales, while tables 6.3 and 6.4 include reliability levels for the multi-item scales. In addition, for the *inward vs. outward* manipulation check, the main study results are compared to the pre-test results obtained.

Table 6.2: Descriptive Statistics for Measures (scales).

<i>Scale</i>			<i>Mean</i>	<i>Std Dev</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i>Cronbach's alpha</i>
<i>Manipulation Checks</i>							
	<i>Scale Items</i>	<i>Scale Points</i>					
Inward vs. outward manipulation scale (Independent dimensions)	5	9	2.99	0.77	-0.21	0.26	.71
Inward vs. outward manipulation scale (Interdependent dimensions)	3	9	3.09	0.97	-0.33	-0.29	.60
Source Credibility Manipulation	4	9	4.77	1.85	-0.20	-0.255	.83
Message sidedness Manipulation	1	7	4.17	2.01	-0.26	-1.236	
<i>Dependent Variables</i>							
Attitude toward the Ad	4	7	4.24	1.53	-0.07	-0.76	.83
Purchase Intention	4	7	3.11	1.49	0.04	-1.03	.94
<i>Covariate Variables</i>							
Reported Cognitive Elaboration	2	7	4.49	1.44	-0.32	-0.448	.65
Involvement	6	7	4.11	1.34	0.14	-0.52	.85
Self-Other orientation (Dependence) dimension	4	5	2.50	0.72	0.40	-0.98	.71
Self-Other orientation (Relationship) Dimension	5	5	3.59	0.55	-0.22	-0.15	.64
Attitude to Technology	5	5	3.13	0.76	-0.15	-0.19	.80
Attitude to Nature	5	5	3.93	0.58	-0.25	-0.16	.62
Food Neophobia	5	5	2.49	0.69	0.23	-0.11	.76
Marketplace Alienation	5	5	3.27	0.62	0.00	-0.14	.68
Initial attitudes	3	5	2.55	1.02	0.01	-0.79	.91
Perceived Benefits	8	5	2.69	0.71	-0.30	-0.08	.88
Perceived Risks	7	5	3.38	0.65	-0.02	-0.16	.85
Perceived knowledge	1	5	2.47	0.98	0.58	-0.13	

As the manipulation checks for both *message sidedness* and *source credibility* manipulations were altered following the pre-test, no comparisons with the earlier results are made. The ANOVA results are then presented in table 6.6.

Table 6.3: Source Credibility Manipulation Scale (Main Study Only)

	<i>Scale Item</i>	<i>Pretest</i>		<i>Main Study</i>	
		Mean	Std Dev.	Mean	Std Dev.
	Source Credibility Manipulation; <i>On the nine point scale below, please rate the message source as;</i>				
1	Insincere (1) – sincere (9)			5.15	2.32
2	Dependable (9)– not dependable (1)			4.73	2.26
3	Trustworthy (9)– not trustworthy (1)			4.66	2.27
4	Not credible (1)– extremely credible (9)			4.59	2.22
	Total four item scale			4.77	1.85
	Reliability (Cronbach’s alpha)			$\alpha = .83$	

Table 6.4: Inward Vs Outward Manipulation Scales

	<i>Scale Item</i>	<i>Pretest</i>		<i>Main Study</i>	
		Mean	Std Dev.	Mean	Std Dev.
	Inward vs. outward manipulation; <i>On the five point scale below, please rate the extent to which the advertisement is suggestive of the following words;</i>				
	<i>Independent items</i>				
1	Self reliant (1) – not self reliant at all (5).	3.58	1.43	3.18	1.19
2	Autonomous (1) – not autonomous at all (5).	3.92	1.45	2.13	0.72
3	Completely separate (1) – not separate at all (5)	4.44	1.35	3.15	1.15
4	individualist (1)– not individualist at all (5)	4.07	1.20	3.24	1.25
5	Independence (1)– not suggestive of independence at all.(5)	3.65	1.31	3.27	1.22
	<i>Interdependent items</i>				
7	Communal (5)– not communal at all. (1)	4.16	1.34	3.33	1.21
8	Concern for others (5)– not suggestive of concern for others (1)	4.41	2.16	2.77	1.30
9	Extremely suggestive of interpersonal relationships (5)– not suggestive of interpersonal relationships at all.(1)	3.97	1.16	3.16	1.37
	Total six item scale			3.00	1.10
	Total nine item scale	3.98	.94		
	Reliability (Cronbach’s alpha) Combined	$\alpha = .80$		$\alpha = .65$	
	Reliability Independent items only			$\alpha = .71$	
	Reliability Interdependent items only			$\alpha = .60$	

Table 6. 5: One-Two Sided Message Manipulation Scale

<i>Scale Item</i>	<i>Pretest</i>		<i>Main Study</i>	
	Mean	Std dev.	Mean	Std dev.
Message sidedness manipulation				
To address concerns regarding Frankenstein foods, to what extent does the advertisement use a message relating to nature mixing things up?			4.17	2.01

To confirm the effectiveness of the experimental manipulations, the results of the three separate one-way Analysis of Variance (ANOVA) are reported in Table 6.6 and discussed in more detail below. These tests were conducted using the total scale means as dependent variables.

Table 6.6: Descriptive Statistics & Anova Results for manipulation checks

	<i>Mean</i>	<i>Std Dev.</i>	<i>Total Mean</i>	<i>F</i>	<i>Sig.</i>
<i>Message Sidedness</i>					
One-sided.	3.35	2.00	4.17	78.09	p =<.000
Two-sided	5.05	1.66			
<i>Inward vs. Outward message focus (independent items only)</i>					
Inward.	2.95	0.63	3.03	6.75	p =< 0.05
Outward	3.12	0.61			
<i>Inward vs. Outward message focus (interdependent items only)</i>					
Inward	2.94	0.93	3.09	9.85	p =< 0.005
Outward	3.25	0.98			
<i>Source Credibility</i>					
Low	4.77	1.91	4.80	0.06	p= .94
High	4.76	1.81			

The results indicate that the *message sidedness* manipulation was successful, as was the *Inward vs. Outward* message manipulation. The *source credibility* manipulation was not confirmed as successful, at least according to the instrument we used to measure credibility in this study. It is therefore unclear if participants actually perceived different levels of credibility of the source, as the lack of a significant result could also be due to

the insufficient sensitivity of the scale used and therefore, results from this manipulation may not be strong enough to generate a significant effect. As a final step, the effect of the demographic variables on the manipulation checks was undertaken. No significant differences were observed for gender, age, income, location or education level.

6.5 Hypothesis Testing and Interaction Effects

This section begins by looking at the hypothesized effects for perceptions of risks and benefits, discusses the results for perceived source credibility, moves to reporting the results for attitude toward the ad. and concludes with those relating to purchase intention effects.

6.5.1 Determinants of Risk Perceptions

To test H1a, H2a, and H3a, ANCOVA was conducted with *perceptions of risk* as the dependent variable and the three message factors, *source credibility*, *message sidedness* and *inward vs. outward focus* as fixed factors. The five general attitudes, *attitude to technology*, *attitude to nature*, *food neophobia*, *marketplace alienation* and *personal knowledge* were included as covariates along with *initial attitudes* and *the self-other orientation (dependence)* and *(relationship)* dimensions to test for the congruency effects outlined in H2a. The results are reported in table 6.7 below, and it appears that only one message factor, *inward vs. outward focus* produced a main effect ($F=4.89$, $p<0.05$, $\eta_p^2 = 0.01$). In addition, *inward vs. outward focus* and *message sidedness* produced interaction effects. ($F=4.73$, $p<0.05$, $\eta_p^2 = 0.01$). A number of covariate factors also produced significant results, *initial attitudes* ($F=22.36$, $p<0.001$, $\eta_p^2 = 0.05$), *attitude to nature* ($F=16.68$, $p<0.001$, $\eta_p^2 = 0.04$), *attitude to technology* $F=5.64$, $p<0.05$, $\eta_p^2 = 0.01$),

marketplace alienation ($F=12.87$, $p<0.01$, $\eta_p^2 = 0.03$), and *self-other orientation (dependence)* ($F=3.97$, $p<0.05$, $\eta_p^2 = 0.01$). These results are next discussed in relation to hypotheses H1a, H2a and H3a.

Table 6.7: Independent and Covariate Effects on Perceptions of Risk

<i>Source</i>	<i>F</i>	<i>Sig.</i>	<i>Partial Eta Squared (η_p^2)</i>
<i>Covariates</i>			
Initial Attitudes	22.36	.00	.058
Attitude to technology	5.64	0.01	0.01
Attitude to nature	16.68	0.00	0.04
Food neophobia	0.02	0.88	0.00
Marketplace alienation	12.87	0.00	0.03
Personal knowledge	0.43	0.03	0.01
Self-other orientation (dependence)	3.97	0.04	0.01
Self-other orientation (relationship)	0.24	0.62	0.00
<i>Independent variables</i>			
Message sidedness	1.95	0.16	0.00
Inward vs. outward focus	4.89	0.02	0.01
Source credibility	0.28	0.59	0.00
Message sidedness* Inward vs. outward focus	4.73	0.03	0.00
Message sidedness* Source credibility	1.44	0.23	0.00
Inward vs. outward focus * source credibility	0.13	0.71	0.00
Message sidedness * Inward vs. outward focus * source credibility	1.72	0.19	0.01

R Squared = .349 (Adjusted R Squared = .325)

6.5.1.1 Hypothesis 1a

H1a proposed that for the initially unsupportive, the two-sided appeal would lower perceptions of risks to a greater extent than the one sided. The above results show that the message sidedness manipulation did not produce a significant main effect on risk perceptions and while initial attitudes were a significant indicator, those higher in initial opposition had significantly higher perceptions of risk (mean = 3.87) than those who were more supportive of GMFs (mean = 3.23, $F= 55.63$, $p<0.001$, $\eta_p^2 = 0.12$). However

the interaction effect between message sidedness and inward vs. outward message focus ($F= 4.73$, $p<0.05$, $\eta^2 =0.00$), suggests that the two-sided message was more effective than the one-sided at lowering perceptions of risks, but only when accompanied by an outward focus. H1a therefore receives partial support, as the two-sided message was associated with lower perceptions of risks, although not for the initially opposed but when accompanied by an outward message focus.

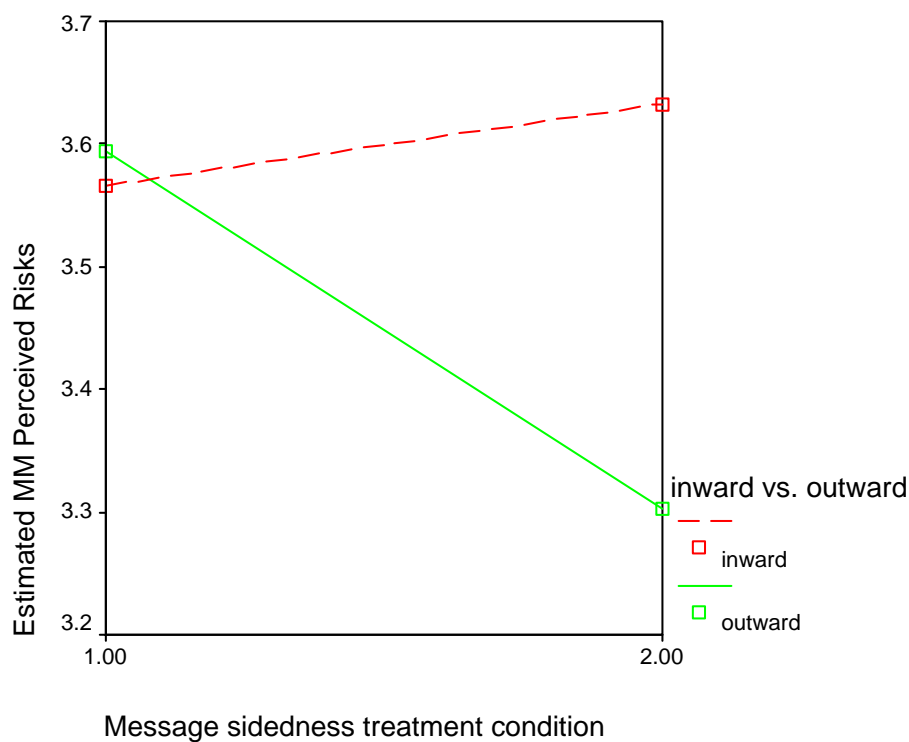


Figure 6.1: Means plot for message sidedness and inward vs. outward focus on perceived risks.

6.5.1.2 Hypothesis 2a

H2a suggested that congruency between inward vs. outward message focus and self/other orientation would lead to lower perceptions of risk than incongruency, and the results show a significant effect for both the inward vs. outward message focus ($F=4.89$,

$p < 0.05$, $\eta^2 = 0.01$) and a covariate effect of the self vs. other orientation (dependence) ($F = 3.97$, $p < 0.05$, $\eta^2 = 0.01$). These give directional support to the proposed congruency effect. The inwardly focused message was associated with a higher perception of risk (mean = 3.59) than the outwardly focused message (mean = 3.45), and those with an increasingly self-orientation (mean = 3.59) also perceived higher risk in the message than those with an increasingly other-orientation (mean = 3.41), this relationship was not statistically significant however ($F = 2.58$, ns) and therefore H2a therefore receives directional support only.

6.5.1.3 Hypothesis 3a

H3a tested whether Bredahl's (2001) general variables would continue to influence perceptions of risk following exposure to a message supportive of GMFs. Three of the five proposed covariates were significant; these were *attitude to technology* ($F = 5.65$, $p < 0.01$, $\eta^2 = 0.0$), *attitude to nature* ($F = 16.68$, $p < 0.001$, $\eta^2 = 0.04$) and *marketplace alienation* ($F = 12.87$, $p < 0.001$, $\eta^2 = 0.03$). Neither *food neophobia* ($F = 0.02$, ns) nor *personal knowledge* ($F = 0.43$, ns) had any significance. Table 6.8 shows the directions of the relationships, with attitudes to nature, and market place alienation all positively influencing risk perception and attitude to technology having a negative influence. H3a receives partial support.

Table 6.8 Significant individual difference determinants of perceived risks

	<i>Low risk perception</i> <i>n=179</i>		<i>High risk perception</i> <i>n=201</i>	
	Mean	Std Dev.	Mean	Std Dev
<i>Attitude to Technology</i>	3.37	0.71	2.92	0.73
<i>Attitude to Nature</i>	3.76	0.58	4.08	0.55
<i>Marketplace Alienation</i>	3.04	0.57	3.48	0.59

6.5.2 Determinants of Benefit Perceptions

As with perceptions of risk, to test H1b, H2b, and H3b, ANCOVA was conducted with *perceptions of benefits* as the dependent variable and the three message factors, *source credibility*, *message sidedness* and *inward vs. outward focus* as fixed factors. The five general attitudes, *attitude to technology*, *attitude to nature*, *food neophobia*, *marketplace alienation* and *personal knowledge* were included as covariates along with *initial attitudes* and the *self-other orientation (dependence)* and (*relationship*) dimensions to test for the congruency effects outlined in H2b. The results are reported in table 6.9 below, which show that no main effects were produced by the message factors, although a significant interaction between inward vs. outward message factor and message sidedness occurred ($F=5.65$, $p<0.05$, $\eta_p^2 = 0.01$). A number of covariate factors also produced significant results, *initial attitudes* ($F=73.73$, $p<0.01$, $\eta_p^2 = 0.16$), *attitude to nature* ($F=29.70$, $p<0.01$, $\eta_p^2 = 0.07$), *attitude to technology* ($F=5.64$, $p<0.05$, $\eta_p^2 = 0.01$), and *marketplace alienation* ($F=9.94$, $p<0.01$, $\eta_p^2 = 0.07$). Neither of the self-orientation measures were significant and neither were three of Bredahl's measures, attitude to technology, personal knowledge and food neophobia. These results are discussed in relation to hypotheses H1b, H2b, and H3b next.

Table 6.9: Independent and Covariate Effects on Perceptions of Benefits

<i>Source</i>	<i>F</i>	<i>Sig.</i>	<i>Partial Eta Squared</i> (η_p^2)
<i>Covariates</i>			
Initial Attitudes	73.73	0.00	0.16
Attitude to Technology	3.23	0.07	0.00
Attitude to Nature	29.70	0.00	0.07
Food Neophobia	0.11	0.73	0.00
Marketplace Alienation	9.94	0.00	0.02
Personal knowledge	0.37	0.53	0.00
Self-Other Orientation (relationship)	2.28	0.13	0.00
Self-Other Orientation (dependence)	0.38	0.53	0.00
<i>Independent variables</i>			
Inward vs. Outward focus	2.96	0.08	0.00
Message Sidedness	0.14	0.70	0.00
Source Credibility	0.06	0.79	0.00
Inward vs. Outward focus * Message sidedness	5.65	0.01	0.01
Inward vs. Outward focus * Source Credibility	1.45	0.22	0.00
Message Sidedness * Source Credibility	0.85	0.35	0.02
Inward vs. Outward Focus * Message sidedness * Source Credibility	0.67	0.41	0.00

6.5.2.1 Hypothesis 1b.

H1b proposed that for the initially unsupportive, the two-sided appeal would raise perceptions of benefits to a greater extent than the one-sided. No significant results were achieved for the message sidedness manipulation however and for initial attitudes, those who were more supportive of GMFs prior to message exposure perceived more benefits (mean = 2.79) than those initially unsupportive (mean = 1.91, $F = 125.91$, $p < 0.01$, $\eta_p^2 = 0.24$). However as with the perceived risks results, an interaction effect between message sidedness and inward vs. outward message focus was evident for perceived benefits. This result suggests that the two-sided message was more effective than the one-sided at

increasing perceptions of benefits, but only when accompanied by an outward focus.

H1b therefore receives partial support.

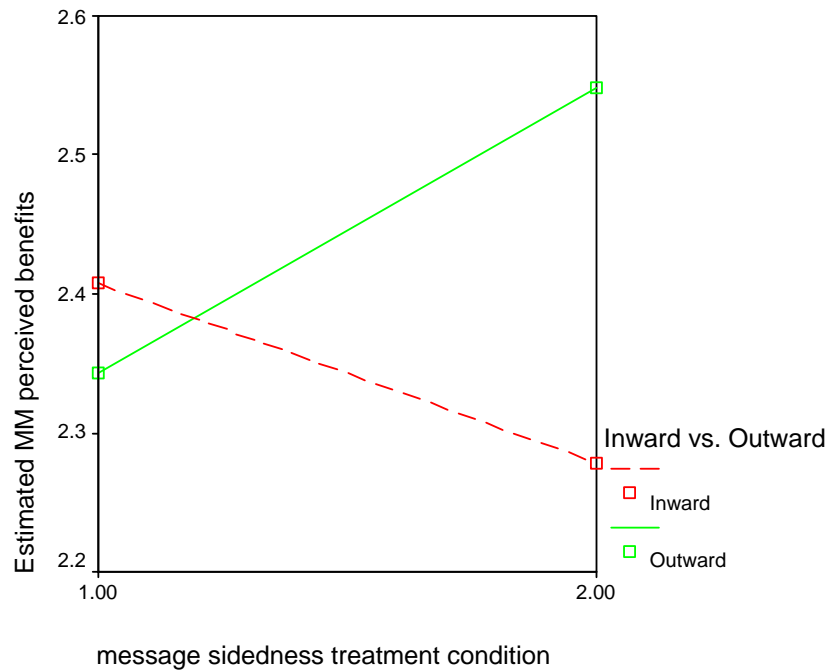


Figure 6.2: Means plot for message sidedness and Inward vs. Outward focus on perceived benefits.

6.5.2.2 Hypothesis 2b

H2b suggested that congruency between inward vs. outward message focus and self/other orientation would lead to higher perceptions of benefits than incongruency. The results show that the inward vs. outward message manipulation approached but did not achieve significance ($F=2.96$, $p= 0.08$), and neither measure of self vs. other orientation, relationship, ($F=2.28$, ns) nor dependence, ($F=0.38$, ns) achieved significance. While the interaction effect discussed above shows an effect for the outwardly focused message when accompanied by a two-sided message, H2b is not supported.

6.5.2.3 Hypothesis 3b

Two of the five general covariates proposed by Bredahl's (2001) and Gamble (2000) influenced *perceptions of benefits*, these were *attitude to nature* ($F= 29.70$, $p<0.01, \eta_p^2=0.07$) and *marketplace alienation* ($F= 9.94$, $p<0.01, \eta_p^2=0.02$). Attitude to technology approached but did not reach significance ($F= 0.11$, $p<0.07$), while neither *food neophobia* ($F= 0.11$, ns) nor *personal knowledge* ($F= 0.37$, ns) had any significance. Table 6.10 shows the directions of the two significant relationships, *attitude to nature*, and *market place alienation*, as well as *attitude to technology*. The table shows that attitudes towards technology were positively associated with benefit perceptions, while both attitude to nature and market place alienation were negatively associated with benefit perceptions. H3b therefore receives partial support.

Table 6.10: Significant individual difference determinants of perceived benefits.

	<i>Low benefit Perception (n=171)</i>		<i>High benefit Perception (n=2090)</i>	
	Mean	Std Dev.	Mean	Std Dev
<i>Attitude to Technology</i>	2.87	0.71	3.34	0.73
<i>Attitude to Nature</i>	4.10	0.56	3.79	0.57
<i>Marketplace Alienation</i>	3.50	0.68	3.09	0.58

6.5.2.4 Hypothesis 4

H4 tested whether the effectiveness of a source credibility manipulation within this context would be mediated by initial attitudes. As reported in table 6.6 above, the manipulation checks suggest that reported differences in perceptions of source credibility were not attributable to exposure to either the low or high credibility manipulation. To further test H4, ANCOVA was performed using *perceptions of source credibility* as the dependent variable, *source credibility manipulation*, *message sidedness* and *inward vs.*

outward message focus as independent variables and *initial attitudes* as a covariate variable. The results confirmed that the *source credibility manipulation* was not significant in influencing *perceptions of source credibility* ($F = 0.25$, ns) and therefore H4 was not supported.

Table 6.11: Determinates of Source Credibility

Source	F	Sig.	Partial Eta Squared
<i>Covariate variables</i>			
Initial attitudes	63.92	0.00	.147
<i>Independent variables</i>			
Message Sidedness	2.04	0.15	.005
Inward vs. Outward focus	0.14	0.70	.000
Source credibility	0.25	0.61	.001
Message sidedness * Inward vs. outward focus	2.18	0.14	.006
Message sidedness * Source credibility	0.23	0.62	.001
Inward vs. outward focus * Source credibility	0.78	0.37	.002
Message sidedness * Inward vs. outward focus*	1.31	0.25	.004
Source credibility			

Instead, the ANCOVA results showed a significant influence of *initial attitudes* on *perceptions of source credibility* ($F=63.92$, $p<0.001$, $\eta_p^2 = 0.14$) and this effect was in the expected direction, with those opposing GMFs rating the source as significantly less credible (mean = 4.14) than those supporting GMFs (mean = 5.28, $p<0.001$, $\eta_p^2=0.09$) regardless of treatment exposure.

6.5.3 Effects of Independent and Covariate Variables on Attitude toward the Ad.

To test H5a, H5b, H6a and the interaction effects outlined in H7, ANCOVA was performed with *attitude toward the advertisement* as the dependant variable, *message*

sidedness, *source credibility* and the *inward vs. outward* manipulation as fixed factors and with the following covariates included; *perceived source credibility*, *initial attitudes*, *perceived benefits*, *perceived risks*, and the *self-other orientation (dependence)* and *(relationship)* dimensions. Covariates also included were *attitude to technology*, *attitude to nature*, *personal knowledge*, *food neophobia* and *marketplace alienation*, along with *cognitive elaboration* and *involvement*. The overall mean score for *attitude toward the advertisement* was somewhat positive, (mean = 4.25 on a seven point scale, with one representing the least favourable and seven the most favourable attitude) and as evidenced from the results in table 6.12, the model had some explanatory value with an overall adjusted R^2 of 0.31. A small main effect was found for *message sidedness*. ($F = 3.78$, $p = <0.05$, $\eta_p^2 = 0.01$) and small effects were found for the covariates *marketplace alienation* ($F = 8.13$, $p = <0.01$, $\eta_p^2 = 0.02$), *cognitive elaboration* ($F = 4.01$, $p = <0.05$, $\eta_p^2 = 0.01$) and *self-other (relationship)* ($F = 7.73$, $p = <0.05$, $\eta_p^2 = 0.01$). A larger effect was found for the covariate *perceived source credibility*, ($F = 75.14$, $p = <0.01$, $\eta_p^2 = .16$) and two significant two-way interaction effects were found, the first between *message sidedness* and *inward vs. outward* message focus ($F = 6.06$, $p = <0.05$, $\eta_p^2 = 0.01$) and the second between *source credibility* and *inward vs. outward* message focus ($F = 5.55$, $p = <0.05$, $\eta_p^2 = 0.01$). These results are discussed further in relation to the hypothesised effects.

Table 6.12: Effects of Independent Variables & Covariates on Att toward the Ad.

<i>Source</i>	<i>F</i>	<i>Sig.</i>	<i>Partial Eta Squared</i>
<i>Covariates</i>			
Perceived source credibility	75.14	p =<0.01	0.17
Self-other orientation (relationship)	7.33	p =<0.01	0.02
Self-other orientation (dependence)	1.71	p =0.19	0.00
Involvement	0.18	p =0.66	0.00
Attitude to technology	0.07	p =0.78	0.00
Attitude to nature	0.85	p =0.35	0.00
Food neophobia	0.15	p =0.69	0.00
Market place alienation	8.13	p =<0.01	0.02
Personal knowledge	0.59	p =0.44	0.00
Perceived benefits	1.06	p =0.30	0.00
Perceived risk	1.81	p =0.17	0.00
Initial attitudes	0.23	p =0.62	0.00
Cognitive elaboration	4.01	p =<0.05	0.01
<i>Independent variables</i>			
Message sidedness	3.78	p =0.05	0.01
Inward vs. outward focus	0.00	p =0.98	0.00
Source credibility	0.00	p =0.96	0.00
Message sidedness * Inward vs. outward focus	6.06	p =<0.05	0.01
Message sidedness * source credibility	0.00	p =<0.96	0.00
Inward vs. outward focus *Source credibility	5.55	p =<0.01	0.01
Message sidedness * Inward vs. outward focus *			
Source credibility	0.70	0.40	0.00

R Squared = .350 (Adjusted R Squared = .310)

6.5.3.1 Hypothesis 5a and H5b

H5a proposed that perceptions of risk would negatively influence attitudes towards the ad., while H5b proposed that perceptions of benefits would positively influence attitudes toward the ad. The above results show however that neither perceived risks nor perceived benefits were of any significance in influencing attitude toward the ad. H5a and H5b are therefore not supported.

6.5.3.2 Hypothesis 6a

H6a proposed that perceptions of source credibility would be positively associated with attitude toward the ad., and as is evident from the results above, *perceptions of source credibility* did have a significant effect on *attitude toward the ad.* ($F = 75.14$, $p = <0.001$, $\eta_p^2 = 0.16$) with the advertisement being less persuasive when the source was considered low in credibility ($mean = 3.48$) than when considered high ($mean = 4.73$). H6a is supported.

6.5.3.3 Hypothesis 7a

H7a suggested an interaction effect between message sidedness and perceptions of source credibility, based on a correspondence inference approach, whereby perceptions of source credibility would be heightened. Moreover, stronger effects on attitudes toward the ad. would be evident for two-sided messages when the recipient was initially opposed to GMFs and the message was perceived to be from a highly credible source. However no interaction effect between message sidedness and source credibility was evident ($F = 0.00$, ns) and therefore H7a is not supported.

The results in table 6.12 indicate that the *message sidedness* manipulation did have a main effect on *attitude toward the ad.* ($F = 5.31$, $p = <0.05$, $\eta_p^2 = .01$), and overall the two-sided advertisement ($mean = 4.43$) was more effective than the one-sided ($mean = 3.98$). Because the two-sided advertisement was found to be more powerful, the analysis then looked at whether the correspondence inference theories could provide an explanation for these results by testing whether greater source credibility was associated with the two-

sided than the one-sided message. When using two items only from the source credibility scale (*item a, the source was insincere-sincere and item d, the source was credible- not credible*), results suggest that *perceptions of source credibility* did differ between the one and two-sided message in the expected way. The two-sided appeal was associated with higher perceptions of source credibility (mean = 5.09) than the one-sided (mean =4.61, $F=5.26$, $p<0.05$), and therefore while H7a could not be supported, the results do suggest that the two-sided message was associated with higher perceptions of source credibility than the one-sided.

6.5.3.4 Hypothesis 7b

H7b suggested an interaction effect between message sidedness and inward vs. outward message focus, so that when measured by attitudes toward the ad., the two-sided message would be most powerful when there was congruency between the self-other orientation of the message recipient and the inward vs. outward focus of the message. It was suggested that this effect would be due to greater cognitive elaboration in conditions of congruency and also inoculation effects inhibiting counter argumentation and encouraging supportive arguing in the two-sided message. An interaction effect between message sidedness and inward vs. outward message focus was found, as displayed in figure 6.3, which suggests that attitudes toward the ad., were more positive with the two-sided appeal, but only when the message was outwardly focused. Message sidedness had minimal impact when the focus was inward.

Analysis then looked at the role that cognitive elaboration had on these results. No significant differences in cognitive elaboration levels were found between either message sidedness condition or between the inward–outward message focus conditions (displayed in table 6.13), disconfirming the role of both the inoculation principles and the congruency effects.

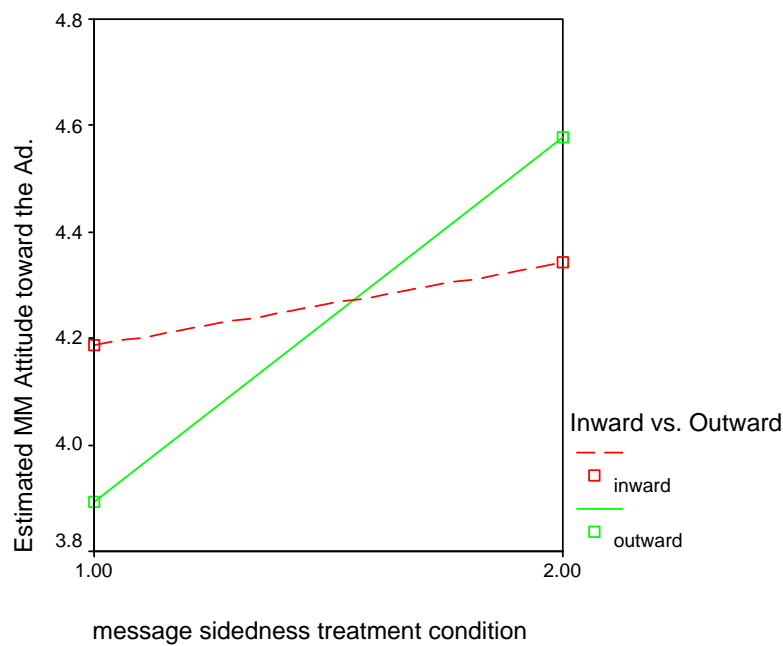


Figure 6.3: Means plot for message sidedness & inward vs. outward focus on Attitude toward the Ad.

Table 6:13: Cognitive elaboration differences in message sidedness and inward vs. outward focus conditions

	<i>Mean Cognitive Elaboration score.</i>	<i>Std Dev.</i>	<i>F</i>	<i>Sig.</i>
Inward focused treatment	4.53	1.35	0.26	ns
Outward focus treatment	4.45	1.53		
One sided message	4.48	1.40	0.00	ns
Two sided message	4.49	1.49		

Further, the relationship dimension of *self-other orientation* had a main effect on *attitude toward the ad* ($F=7.23$, $p < 0.05$, $\eta_p^2 = 0.02$), whereby a stronger effect was observed for

those who were increasingly other-oriented (mean=4.52), compared to those who were increasingly self-oriented. (mean = 3.93, $F = 14.29$, $p < 0.001$) the increasingly other-orientated exhibited greater preference for the appeal regardless of the treatment manipulation they were exposed to. Once again analysis looked at the differences in cognitive elaboration levels and as table 6.14 shows, no significant differences were found between the self and other-oriented on either the dependence or the relationship measures for the covariate cognitive elaboration.

Table 6.14: Cognitive Elaboration differences between self-other orientations

	<i>mean Cognitive Elaboration score.</i>	<i>Std Dev.</i>	<i>F</i>	<i>Sig.</i>
Below mean self-other orientation (depend.)(self oriented)	4.52	1.40	0.34	ns
Above mean self-other orientation (depend.)(other oriented)	4.43	1.50		
Below mean self-other orientation (relat.) (self oriented)	4.40	1.46	1.35	ns
Above mean self-other orientation (relat.) (other oriented)	4.57	1.42		

However, when using the qualitative measures of numbers of positive or negative comments made, some significant differences do appear between the orientations. For both the dependence and relationship measures those higher in other-orientation made more positive comments ($mean = 0.98$, dependence) and ($mean = 0.93$, relationship) than those higher in self-orientation (dependence, $mean = 0.75$, $F = 4.53$, $p < 0.05$, $\eta_p^2 = 0.012$) and (relationship, $mean = 0.73$, $F = 3.59$, $p < 0.05$, $\eta_p^2 = 0.009$) and when measured on the relationship dimension, significantly fewer negative arguments were made by the other-oriented ($mean = 1.07$) than by the self-oriented ($mean = 1.47$, $F = 7.22$, $p < 0.05$, $\eta_p^2 =$

0.019). These results suggest that while no differences in the cognitive elaboration measures were apparent, information processing differences between the self and the other-oriented did exist and that the other oriented were more supportive towards the appeal than the self-oriented.

H7b therefore receives partial support. Although no congruency effect was found, an interaction effect between message sidedness and inward vs. outward message focus did exist.

6.5.3.5 Hypothesis 7c

H7c proposed an interaction effect between *source credibility* and *inward vs. outward focus*, mediated by individual *self-other orientation* and *involvement* levels, based on an expectation of greater cognitive elaboration in conditions of congruency and greater elaboration for the highly involved in conditions of high source credibility. Once again a significant interaction effect between the two variables was shown to exist. The effect suggests that increasingly positive attitudes toward the ad were associated with the high credibility message but only when there was an outward focus to the message. In the low credibility conditions, an inward focus gave rise to similarly strong effects.

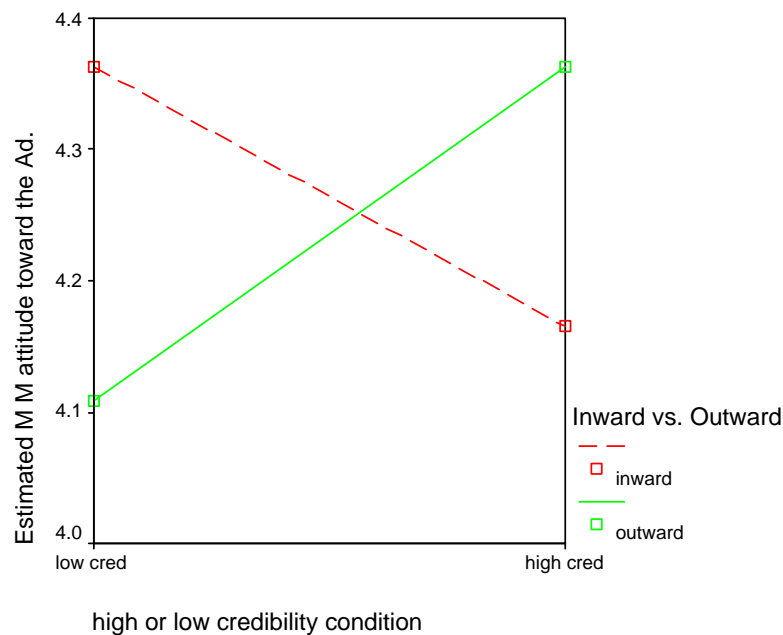


Figure 6.4: Means plot for source credibility & Inward vs. Outward focus on Attitude toward the Ad.

Involvement was not a significant mediator in these results, and as discussed above no congruency effect was found although an ‘other’ orientation was associated with increasingly positive attitudes towards the ad, disconfirming the role of cognitive elaboration in these results. H7c therefore receives partial support.

6.5.3.6 Hypothesis 7d

H7d suggested an interaction effect between all three antecedents, source credibility, message sidedness and inward vs. outward message focus, so that stronger effects for attitudes toward the ad would be apparent for two-sided messages, the message was from a highly credible source, and there was congruency between the self-other orientation of the message recipient and the inward vs. outward focus of the message. No three-way

interaction effect between *message sidedness*, *source credibility* and *inward vs. outward focus* was apparent and therefore H7d was not supported.

6.5.4 Effects of Independent and Covariate Variables on Purchase Intentions.

To test H5c, H5d, H6b and H8 ANCOVA was performed with *purchase intentions* as the dependent variable, *message sidedness*, *source credibility* and *inward vs. outward* manipulations as fixed factors, and the covariates; *cognitive elaboration*, *perceived source credibility*, *initial attitudes*, *involvement*, *personal knowledge*, *perceived benefits*, *perceived risks*, and *self-other orientation* (*dependence* and *relationship* dimensions) included. Also tracked were, *attitude to technology*, *attitude to nature*, *food neophobia*, and *marketplace alienation*. The results of the ANCOVA are displayed in table 6.15 below. Overall the mean for *purchase intention* was somewhat low, (mean = 3.17, on a seven point scale with one representing the lowest purchase intention and seven the highest.) This suggests that while the overall scores for *initial attitudes* (mean = 2.60, on a five point scale) and *attitude toward the ad* (mean = 4.25, on a seven point scale) were moderately positive, these attitude results did not translate into positive intentions to purchase foodstuffs produced with GE technologies. The model produced for *purchase intention* proved to be more successful than that for *attitude toward the ad*, with stronger effects evident and an adjusted R^2 of 0.79. The *inward vs. outward* manipulation approached significance ($F = 3.20$, $p < 0.07$, $\eta_p^2 = 0.01$), while a number of covariates reached significance, *self-other (dependence)* ($F = 3.787$, $p < 0.05$, $\eta_p^2 = 0.01$), *perceived source credibility*, ($F = 5.22$, $p < 0.05$, $\eta_p^2 = 0.01$), *involvement* ($F = 26.05$, $p < 0.001$, $\eta_p^2 = 0.06$), *perceived benefits*, ($F = 32.95$, $p < 0.001$, $\eta_p^2 = 0.8$), *perceived risks*, ($F = 43.46$, $p < 0.0001$, $\eta_p^2 = 0.10$) and *initial attitudes* ($F = 49.11$, $p < 0.001$, $\eta_p^2 = 0.12$). As

expected, *message sidedness* did not have an effect on *purchase intentions*, however neither did either of the remaining message factors, *inward vs. outward focus* and *source credibility*. No interaction effects were found to be of significance. These results are next discussed in terms of H5c, H5d, H6b and H8.

6.5.4.1 Hypothesis 5c and 5d

H5c proposed that perceptions of risk would negatively influence purchase intentions and H5d proposed that perceptions of benefits would positively influence purchase intentions. The results outlined in table 6.15 above show that both *perceived benefits* ($F = 32.95$, $p < .001$, $\eta_p^2 = 0.08$) and *perceived risks* ($F = 43.46$, $p < 0.001$, $\eta_p^2 = .10$) were of significance in determining purchase intentions. Those who had higher perceptions of risk had lower purchase intentions ($mean = 2.15$) than those with low perceptions of risk ($mean = 4.18$, $F = 324.33$, $p < 0.001$, $\eta_p^2 = 0.46$), while those with higher perceptions of benefits had higher purchase intentions ($mean = 4.07$) than those with low perceptions of benefits ($mean = 1.93$, $F = 390.08$, $p < 0.001$, $\eta_p^2 = 0.50$). H5c and H5d are therefore both supported.

6.5.4.2 Hypothesis 6b

H6b suggested that perceptions of source credibility would be positively associated with intentions to purchase GMFs. Once again the results show that perceptions of source credibility were significantly associated with purchase intentions, ($F = 5.22$, $p < 0.02$, $\eta_p^2 = 0.01$) and this association was shown to be in a positive direction with those rating the source as having low credibility having significantly lower purchase intentions ($mean = 2.48$) than those rating the source as highly credible ($mean = 3.52$, $F = 49.07$, $p < 0.001$, $\eta_p^2 = 0.11$). Hypothesis 6b was supported. Two further covariate effects were significant

that were not hypothesised, these were for *initial attitudes* ($F = 49.11$, $p = <0.001$, $\eta_p^2 = .12$) and *involvement*, ($F = 28.18$, $p = <0.001$, $\eta_p^2 = 0.07$). These were both positively associated with purchase intentions, so that more positive initial attitudes were associated with higher purchase intentions (mean=4.00) than opposing initial attitudes (mean= 1.84, $F=241.09$, $p<0.001$, $\eta_p^2= 0.38$), and those with higher involvement levels had significantly higher purchase intentions ($mean = 4.04$) than those with low involvement levels. ($mean = 2.20$, $F=232.81$, $p<0.001$, $\eta_p^2 = 0.38$).

Table 6.15: Independent & Covariate Effects on Purchase Intention.

<i>Source</i>	<i>F</i>	<i>Sig.</i>	<i>Partial Eta Squared (η_p^2)</i>
<i>Covariates</i>			
Personal Knowledge	1.11	0.29	0.00
Involvement	26.05	0.00	0.06
Perceived source credibility	5.22	0.02	0.01
Self-Other (dependence)	3.78	0.05	0.01
Self-Other (relationship)	2.64	0.10	0.00
Attitude to technology	0.39	0.52	0.00
Attitude to nature	3.41	0.06	0.00
Food neophobia	0.04	0.83	0.00
Market alienation	0.19	0.66	0.00
Perceived benefits	32.95	0.00	0.08
Perceived risks	43.46	0.00	0.10
Initial attitudes	49.11	0.00	0.12
Cognitive elaboration	0.12	0.72	0.00
<i>Independent variables</i>			
Message sidedness	0.24	0.62	0.00
Inward vs. outward focus	3.20	0.07	0.00
Source Credibility	0.08	0.76	0.00
Message sidedness * Inward vs. outward focus	0.25	0.61	0.00
Message sidedness * Source credibility	0.69	0.40	0.00
Inward vs. outward focus * Source credibility	0.18	0.66	0.00
Message sidedness * Inward vs. outward focus * Source credibility	0.14	0.70	0.00

R Squared = .806 (Adjusted R Squared = .795)

6.5.4.3 Hypothesis 8

H8 proposed an interaction effect between *source credibility* and *inward vs. outward focus*, mediated by individual *self-other orientation* and *involvement* levels, based on an expectation of greater cognitive elaboration in conditions of congruency and greater elaboration for the highly involved in conditions of high source credibility. As the results in table 6.15 show, no such interaction effect was evident in the results and therefore H8 was not supported.

One of the measures for *self-other orientation (dependence)* did reach significance in its relationship with *purchase intentions* however, ($F = 3.75$, $p = <0.05$) and the mean *purchase intention* values show that those with an increasingly other orientation appeared to have higher *purchase intentions* (mean = 3.18) than those with an increasingly self orientation (mean = 3.05).

6.5.4.4 Additional Analysis

Further analysis was undertaken to determine whether any message effects for purchase intentions could be uncovered, and a three-way interaction was found when using only item (a) from the purchase intention scale, (*If genetically engineered foods were available in the shops, I would intend to: definitely avoid them, definitely buy them (7 points)*). The marginal means plots show the interactive relationship separated by low and high source credibility.

Table 6.16: Interaction Effect Using a One-Item Purchase Intention Scale

<i>Source</i>	<i>F</i>	<i>Sig.</i>	<i>Partial Eta Squared ((η_p^2)</i>
Source Credibility	0.20	0.65	0.00
Message Sidedness	1.63	0.20	0.00
Inward vs. Outward focus	2.79	0.09	0.00
Source Credibility * Message sidedness	0.83	0.36	0.00
Source Credibility * Inward vs. Outward focus	0.02	0.88	0.00
Message sidedness * Self vs. Other (Manipulation)	0.02	0.86	0.00
Source Credibility* Message sidedness * Inward vs. Outward focus.	4.29	0.03	0.01

R Squared = .026 (Adjusted R Squared = .008)

In the low credibility conditions, the one-sided message resulted in the highest purchase intentions when the message had an outward focus. The purchase intention scores for the two-sided message were highest when the message was inwardly focused.

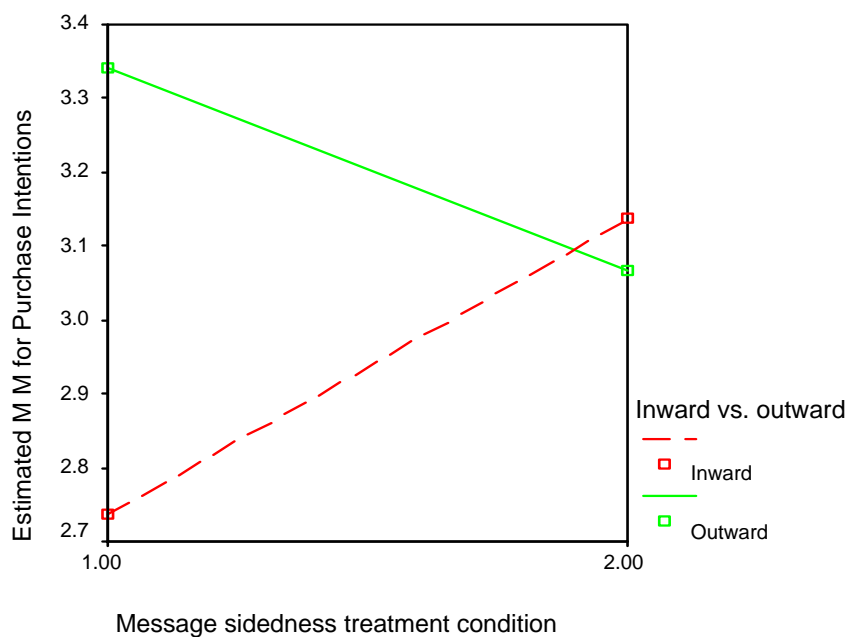


Figure 6.5: Means Plot for three-way interaction on Purchase Intentions. (low credibility)

In the high credibility conditions, the two-sided message had much stronger effects on *purchase intentions*, but only when the message had an outward focus. With an inward focus, message sidedness had no impact. These results suggest therefore that the two-sided message, when accompanied by a high credibility source and an outward focus has the strongest purchase intention effects. When accompanied by a low credibility source however, an inward focus serves the two-sided message better. For a low credibility message, a one-sided outwardly focused message may produce stronger purchase intention effects than a two-sided message.

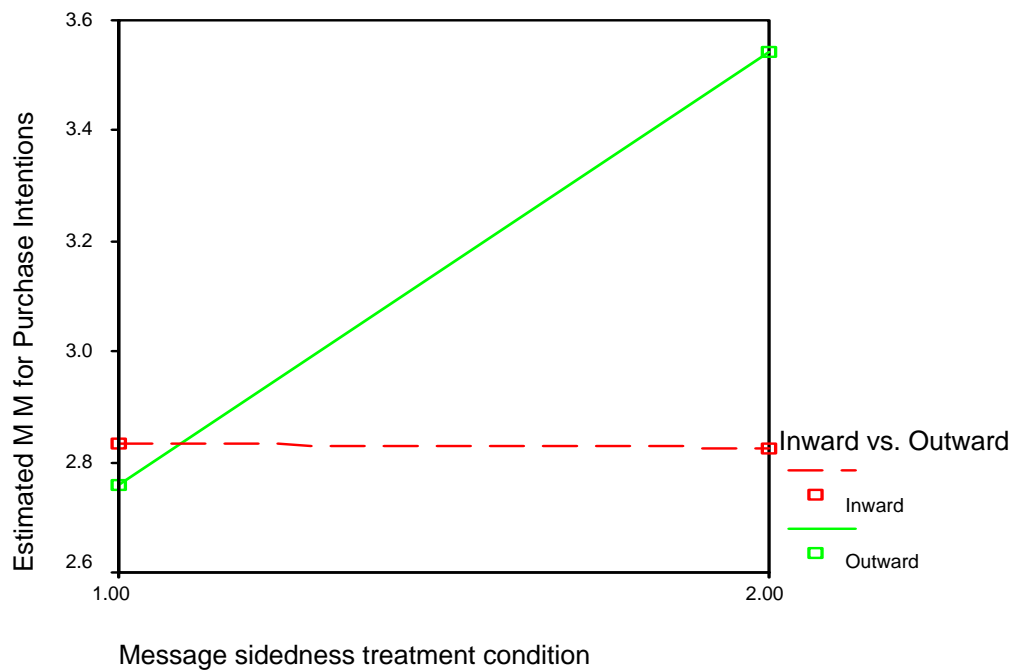


Figure 6.6: Means plot for three-way interaction on Purchase Intention (high credibility).

6.6 Chapter Summary

This chapter presented the results of the statistical analysis of the data collected. The chapter began with an overview of the sample used, outlined the results of the analysis conducted on the scales, presented the results into the effectiveness of the experimental manipulations and then discussed the results of the hypothesis testing as well as a number of interaction effects. Table 6.17 displays a summary of the hypothesis tested and the results obtained by the analysis. In the following chapter, these main results are discussed as well as the limitations of the research and future directions.

Table 6.17: Hypothesis Summary

<i>Perceptions of risks and benefits</i>		
H1a	For the initially unsupportive, the two-sided appeal will lower perceptions of risks to a greater extent than the one sided.	<i>Partial support</i> , the two-sided message more effective than the one-sided when accompanied by an outward focus.
H1b	For the initially unsupportive, the two-sided appeal will raise perceptions of benefits to a greater extent than the one sided.	<i>Partial support</i> , the two-sided message more effective than the one-sided when accompanied by an outward focus.
H2a	Congruency between inward vs. outward message and self/other orientation will lead to lower perceptions of risk than incongruency.	<i>Directional support found</i> , non significant evidence of congruency effect obtained.
H2b	Congruency between inward vs. outward message and self/other orientation will lead to higher perceptions of benefits than incongruency.	Not supported. No evidence of congruency effect obtained.
H3a	Perceptions of risk will be positively associated with attitude to nature, food neophobia, and market place alienation and negatively associated with attitude to technology and personal knowledge.	<i>Partial support found</i> , attitude to technology negatively and attitude to nature and marketplace alienation positively associated with risk perception.
H3b	Perceptions of benefits will be negatively associated with attitude to nature, food neophobia, and market place alienation and positively associated with attitude to technology and personal knowledge.	<i>Partial support found</i> , attitude to technology approached significance and was positively associated with benefit perception, while attitude to nature and marketplace alienation were both negatively associated with benefit perception.

<i>Perceptions of source credibility</i>		
H4	The effect of the source credibility manipulation on perceptions of source credibility will be mediated by prior attitudes towards GMFs.	Not supported. Initial Attitudes the only significant effect on source credibility perception.
<i>Attitudes towards the Ad.</i>		
H5a	Perceptions of risk would negatively influence attitudes attitude toward the ad.	Not supported. Perceptions of risk were not associated with attitude toward the ad.
H5b	Perceptions of benefits would positively influence attitudes toward the ad.	Not supported. Perceptions of benefits were not associated with attitude toward the ad.
H6a	Perceptions of source credibility will be positively associated with attitude toward the ad.	Supported.
H7a	Attitude toward the ad will be more positive when the message is both two-sided and highly credible, than when it is either one-sided and highly credible or two-sided with low credibility.	Not supported, no interaction effect found, although the two-sided message associated with higher perceptions of source credibility than the one-sided.
H7b	Attitude toward the ad will be more positive when the message is both two-sided and there is congruency between inward vs. outward message focus and self-other orientation, than when it is either one-sided with congruency, or two-sided and incongruent.	Partial support. No congruency effect found, although an interaction effect between message sidedness and inward vs. outward message focus did exist.

<i>Attitudes towards the Ad.</i>		
H7c	When there is high involvement, attitudes toward the ad will be more positive when both a highly credible source is used and there is congruency between inward vs. outward message focus and self-other orientation, than when either a highly credible source is used and there is incongruency, or a low credibility source is used and the message is congruent.	<i>Partial support.</i> No congruency effect found, although an interaction effect between source credibility and inward vs. outward message focus did exist
H7d	Attitudes toward the ad will be most positive when the message is two-sided, there is congruency between inward vs. outward message focus and self-other orientation and it has high source credibility.	Not supported, no three-way interaction found.
<i>Purchase Intentions</i>		
H5c	Perceptions of risk would negatively influence purchase intentions.	<i>Supported</i>
H5d	Perceptions of benefits would positively influence purchase intentions.	<i>Supported</i>
H6b	Perceptions of source credibility will be positively associated with intentions to purchase GMFs.	<i>Supported</i>
H8	When there is high involvement, purchase intentions will be more positive when both a highly credible source is used and there is congruency between inward vs. outward message focus and self-other orientation, than when either a highly credible source is used and there is incongruency, or a low credibility source is used and the message is congruent. .	Not supported, no two-way interaction found.

Chapter Seven

Discussion

7.1 Introduction

While much research has been conducted into consumer attitudes towards genetic engineering technologies, little activity has focused on the persuasive effects of appeals advertising GMFs. To address this deficiency, this study integrated elements of Bredahl's (2001) determinants of attitudes towards GMFs with Wansink and Kim's (2001) strategies for educating consumers about these products. The theoretical model developed from the integration of these two frameworks aimed to maximise persuasion effects using message sidedness, source credibility and an inward vs. outward message focus. The persuasion effects were measured by perceptions of source credibility, perceptions of risks and benefits, and by attitude toward the ad and purchase intentions. The relationships hypothesized in the model were tested through an online experiment conducted via the World Wide Web. This chapter will conclude this study with a discussion of the major findings of this research, the implications arising from these findings, limitations of the study, and directions for the future.

7.2 Major Research Findings

7.2.1 Determinants of Perceptions of Risks and Benefits

Both message and individual factors were hypothesized to influence risk and benefit perceptions with results supporting these effects. Of the message factors, the two-sided message was more effective than the one-sided at decreasing risk and increasing benefit perceptions when there was an accompanying outward focus to the message. Directional evidence was found for a congruency effect between inward vs. outward message focus and self-other orientation for lowering perceptions of risk, although not for raising benefits. Of the individual factors, attitude to technology was negatively associated and attitude to nature and marketplace alienation positively associated with lowering risk perception, while attitude to nature and marketplace alienation were both negatively associated with raising benefit perception.

7.2.2 Determinants of Source Credibility perceptions

Initial attitudes were the main determinate of perceptions of source credibility while the source credibility manipulation had no effect.

7.2.3 Attitude Toward the Advertisement

Message factor results suggest that the two-sided message was more powerful than the one-sided at positively influencing attitudes towards the ad. Support for the correspondent inference theories was evident as the two-sided messages were associated with higher perceptions of source credibility than the one-sided. Further results suggest

that the outwardly focused two-sided messages were more powerful at positively influencing attitude toward the ad than either the one-sided outwardly focused messages, or the inwardly focused messages of either sidedness condition. However this effect did not appear to be the result of increased cognitive elaboration. Additionally, the highly credible, outwardly focused message gave rise to persuasive effects that were similar to a low credibility, inwardly focused message. Individual differences also contributed to more positive attitudes towards the ad, these included an increasingly other-orientation, a perception that the source was highly credible and a low level of alienation from the marketplace.

7.2.4 Purchase Intentions

The overall results for purchase intentions suggest that individual differences were the only significant influences. The results show that a higher other-orientation as well as increased involvement resulted in increased purchase intentions, as did positive initial attitudes, a perception that the message used a highly credible source, and a perception that GMFs would contain benefits but be of low risk. Using only a single item from the purchase intention scale, a significant three-way message factor interaction occurred so that purchase intentions were highest in the high credibility conditions when the message was two-sided and accompanied by an outward focus.

7.3 Research Implications

Based on the findings outlined above, several theoretical and managerial implications can be drawn and these are now discussed below.

7.3.1 Theoretical Implications

7.3.1.1 Message Sidedness

The message sidedness effects outlined above confirm expectations, offer some surprises and extend what is known about message sidedness. Expectations were confirmed with results suggesting that message sidedness had a main effect on attitude toward the ad, with the two-sided message being more effective than the one-sided in gaining positive attitudes because of higher perceptions of source credibility. These results are inline with those from many earlier studies that use attribution-based theories, (see for example Anderson & Golden, 1984; Chebat & Picard, 1988; Etgar & Goodwin, 1982; Golden & Alpert, 1978, 1987; Kamins & Assael, 1987; Settle & Golden, 1974; Smith & Hunt, 1978). Other results were contrary to expectations based on studies using inoculation theory, such as Bither et al. (1971), Sawyer (1973) and Szybillo and Heslin (1973) Belch (1981), Swinyard (1981) and Kamins and Assael (1987). No difference was found in the level of supportive or counter argumentation between the one and two-sided conditions, and initial attitudes had no influence over the increased effectiveness of the two-sided message. One possible explanation for these results is that the cognitive response mechanisms commonly found in two-sided messaging studies were not apparent. However the analysis showed the expected differences in counter and supportive arguments between the initially opposed and the initially supportive, between those

declaring themselves to be either high or low in involvement, and that those with an other-orientation were more likely to generate supportive arguments than those with a self-orientation. It appears therefore that appropriate cognitive responses to the subject matter were generated but that these depended on a range of individual differences rather than the message sidedness manipulation. These results therefore offer more support to the attribution-based theories than the inoculation theories.

The remaining message sidedness effects apparent in this study were all evident through interactions with other treatment manipulations. Perceptions of risk were lowest, perceptions of benefits highest and attitudes towards the ad more positive in the two-sided condition, but only when there was an outward focus to the message. More surprisingly, when using a single item measure from the purchase intention scale, a three-way interaction became apparent so that purchase intentions were highest in the two-sided conditions when a highly credible source and outwardly focused message was used. Two aspects of these interaction effects are particularly noteworthy, firstly, that on all persuasive measures the interactions were in the same direction, that is, the two-sided, outwardly focused message was the most effective in generating persuasive effects, and secondly, when combined with a highly credible source, this combination resulted in an unexpected effect on purchase intentions despite the fact that this study did not use correlated product attributes.

These results may lead to an important extension of our understanding of message sidedness effects. The relationship between source credibility and one vs. two-sided

messages has been studied numerous times and is well understood, so that the two-sided message is generally found to be associated with higher perceptions of source credibility than the one-sided, as was observed in this study for attitude toward the ad. The influence that inward vs. outward message focus has on message sidedness research appears to be a novel contribution of this research to the current literature. Results show that message focus may have a significant impact on the persuasiveness of two-sided appeals, with an outward focus consistently providing more effective persuasion results. Because these variables have never previously been researched together it is difficult to determine whether these findings are the result of contextual factors, or whether some other mechanism is driving the relationship. Further analysis shows that the outwardly focused appeal was not associated with either increased levels of supportive ($F = 0.34$, ns) or lower levels of counter-argumentation than the inwardly focused message ($F = 0.0$, ns). Also, the outwardly focused message was not perceived to have higher source credibility than the inwardly focused message, ($F = 0.0$, ns). This suggests that the mechanisms by which two-sided messaging effects are normally explained cannot be applied. It is possible therefore that the relationship between the two-sided message and outward focus is contextual, that is, it is the societal risks that GMFs pose as well as the benefits that may become available that make the outward focus more effective when combined with the two-sided message. However, without further research it remains difficult to determine whether this contextual explanation offers the best fit.

7.3.1.2 Inward vs. Outward Message Focus

One of the more surprising results in this study was the limited success in finding congruency effects between the self-other orientation of a subject and the inward vs. outward focus of a message. In previous work (see for example Han & Shavitt, 1994; Brunel & Nelson, 2000; Wang, Bristol, Mowen & Chakraborty, 2000) both gender and cultural differences have been found so that an inwardly focused appeal has more powerful persuasion effects for the self-oriented (either males or subjects from individualist cultures), while the outwardly focused appeal appears more effective for the other-oriented (females or members of collectivist cultures). Although neither gender nor cultural influences were being investigated here, the expectations were that the congruency effects outlined by Cross and Madson (1997) would be apparent, and subjects who were highly self-oriented would elaborate to a greater extent on the inwardly focused message while those who were other-oriented would elaborate more on the outwardly focused message. These information processing strategies were expected to lead to greater persuasion effects when congruency between orientation and message focus occurred. However, in this study, when persuasion was measured by perceptions of benefits, attitude toward the ad or purchase intentions, these effects were not observed, although directional evidence of this congruency effect was obtained for perceptions of risk. No differences in cognitive elaboration were found for inward vs. outward focus ($F = 0.33$, ns), self-other (relationship) ($F = 2.04$, ns) or self-other (dependence) ($F = 0.2$, ns) and therefore this study offers only directional support for Cross and Madson's (1997) congruency effects when measured against risk perceptions.

While unexpected, these results are not totally without explanation or precedence from past literature. Aaker and Williams' (1998) results contradicted both their expectations and previous studies when they found that ego-focused appeals led to more favourable responses from subjects in collectivist cultures, while subjects in individualistic cultures preferred other-focused appeals. They explained these results as being due to the generation and elaboration of novel thoughts. This explanation does not fit well with our results for a number of reasons. Firstly, some evidence of congruency effects was found, secondly, the interaction results suggest that the outwardly focused appeal was more effective than the inwardly focused appeal when combined with either a two-sided or a highly credible message and finally, regardless of treatment condition, an increasingly other-orientation was associated with a greater number of supportive arguments a lower number of negative comments, a higher perception of benefits, a greater preference for the ad and higher purchase intentions. Two previous studies by Myers-Levy (1988) and Jaffe (1991) were identified which have also found results suggesting that the other-oriented were more responsive to persuasive effects. Myers-Levy (1988) found that females were equally receptive to both self-oriented and other-oriented appeals, whereas males preferred only the self-oriented appeal. These results were explained as being consistent with the use of a prime to activate the sex role of the subject. Jaffe (1991) also found an association between an increasingly other-orientation (measured by higher femininity scores) and greater persuasion effects for both an agentic and a communal appeal for financial services, explaining this as being the result of the product used. In the present study, other-orientation was associated with more supportive thoughts about the appeals resulting in greater persuasion effects, and it is possible that like Jaffe (1991)

a contextual explanation is necessary. Because the context of GMFs is associated with an awareness of the risks and benefits for society as a whole rather than just for individual consumers, the subject matter is likely to be of greater innate interest to those with an other-orientation rather than a self-orientation. This greater interest contributed to the other-oriented generating more supportive arguments and less negative arguments about the appeals, being more receptive to the possibility of increased benefits and lower risks, and ultimately resulted in the appeals having greater persuasive effects. This argument suggests that an other-orientation acted in a manner similar to involvement, and further analysis of the data shows that while initial attitudes did not differ between the self ($\xi = 2.45$) or the other-oriented ($\xi = 2.64$, $F = 3.08$, ns), those with an increasingly other-orientation (relationship dimension) did have significantly higher involvement levels ($\xi = 4.26$) than those with an increasingly self-orientation ($\xi = 3.94$, $F = 5.36$, $p < 0.05$), suggesting that this context at least, an other-orientation enhanced involvement levels contributing to increased positive responses and greater persuasion effects.

7.3.1.3 Source Credibility

In this study the manipulation checks conducted for source credibility could not confirm that the treatment was successful. Either the manipulation was not salient enough in the experiment or the instrument used to measure credibility was not sensitive enough to pick up these differences. The treatment design followed Frewer et al. (1996, 1999) as well as Gamble et al. (2000) in differentiating the source on the dimension of trustworthiness. In exploratory work, these researchers had found that consumer groups were among the most trusted sources of information about GMFs, while industry groups were among the least trustworthy. When measured by the third item on the source credibility perceptions

scale, directional differences were seen in the trustworthiness of the source between the low ($\xi = 4.64$) and high credibility conditions ($\xi = 4.70$, $F = 1.63$, ns), however these differences did not reach statistical significance.

The absence of statistically significant results for both the combined scale and the trustworthiness dimension suggests that the manipulation itself was not strong and participants were unable to distinguish between the low and high credibility conditions. As stated above, it is possible that differences did exist, but that the instrument used to measure the effects was not sensitive enough to uncover them. The non-significant results obtained from this study limit the extent to which information can be extracted with regards to source credibility, however, several comments can still be made with confidence. Firstly, the results observed do support those found by Frewer, Bredahl and Scholderer (2003) who suggested that trust in the information source was determined largely by prior attitudes to GM. Perceptions of source credibility were influenced not by the treatment manipulation, but by initial attitudes so that those who were initially unsupportive of GMFs perceived the source to be less credible than those initially supportive. It could be that in this context, the influence of initial attitudes was so great that achieving successful treatment effects with any manipulation of source credibility would be difficult. Further replication would enable this explanation to be tested.

It is also possible that differences in the source credibility manipulations did exist, but that they were insufficient to have independent effects, and therefore apparent only when combined with the other treatment variables. Given the interaction effects observed in

the study, it appears that this may be the case. Only in the high source credibility conditions were higher purchase intentions evident when the message was both two-sided and outwardly focused. The high source credibility manipulation was also associated with increasingly positive attitude towards the ad when the message had an outward focus.

These results suggest two important points. Firstly, in this context at least, a highly credible or trustworthy source is insufficient to influence persuasion, but contributes to persuasion effects when combined with other message factors. Secondly, these results add to the knowledge about source credibility by including the influence of an outward message focus and in doing so, represent a first step in addressing the need to investigate the relationship between source credibility and inner vs. outer directedness (Pornpitakpan, 2004). Our results suggest that an outwardly directed message that uses a highly credible source is likely to have stronger persuasive effects than an inwardly directed message using the same source. The fact that this effect was observed over two persuasive measures, attitude towards the ad and purchase intentions (when combined with a two-sided message) adds weight to this relationship.

7.3.1.4 The Bredahl (2001) and Wansink and Kim (2001) Frameworks

Further theoretical implications relate to the use of the two context specific frameworks underpinning the theoretical development of this study. These are Bredahl's (2001) framework addressing the determinants of attitudes towards Genetic Engineering technologies and Wansink and Kim's (2001) education strategies.

Bredahl's (2001) Framework

Bredahl's earlier results had shown that attitude to technology, attitude to nature, food neophobia, marketplace alienation and personal knowledge all influenced perceptions of risks and benefits, which in turn influenced attitudes towards the use of GE technologies in food production. These results were extended by this study, so that following exposure to an advertising appeal, four of the five continued to influence perceptions of risks and benefits, while one, marketplace alienation, also had a direct influence on attitude toward the ad. The fifth variable, personal knowledge failed to influence any of the dependent measures after exposure to an advertising appeal, suggesting direct knowledge had little influence on persuasion effects.

Wansink and Kim's (2001) Educational Strategies

Two of the variables suggested by Wansink and Kim (2001) were tested in this study, message sidedness and source credibility. The results suggest support for the use of both variables, however the means through which their effectiveness occurred remains open to investigation. The authors suggest that the two-sided message should be more effective for central route processors, while the one-sided would be more effective for peripheral route processors. Our results do not support this however, as message sidedness had no effect on the level of supportive or counter arguments, nor was message sidedness significant in influencing the covariate cognitive elaboration. The effectiveness of the two-sided message was not contingent on the use of central route processing, but was instead associated with higher perceptions of source credibility and found to be more powerful overall than the one-sided message. As no main effects for the source credibility manipulation were found, no support can be given to Wansink and Kim's

(2001) proposition that peripheral route users would be more positively influenced by a high credibility source than a low credibility source, even though the interactions suggest some greater persuasive effects for the high credibility source when combined with other message factors.

7.3.2 Managerial Implications

As this study used an experimental research design, the emphasis here is on theory testing and as such any reported results may not be generalisable to a population of consumers. The managerial implications offered below should therefore be treated with some caution.

7.3.2.1 Consider Two Sided Messages

The first managerial implication is that the use of two sided messages should be considered when designing promotional materials for GMFs. The two-sided message was associated with higher perceptions of source credibility and more positive attitudes toward the ad than the one-sided and this effect represents both a direct influence and an indirect influence of the two-sided message, (increasing perceptions of source credibility also directly contributed to more positive attitudes toward the ad).

In New Zealand, two sided messaging is somewhat atypical in advertising design, although a number of successful campaigns have used the approach in recent years. The current study has confirmed previous findings that refutational two sided messaging is a useful technique when opposition or controversy exists, as is the case with GMFs. Additionally, when advertisers wish to increase perceptions of credibility, they may have

more success in doing so when using a two sided approach than they would using a one sided.

7.3.2.2 Consider Outwardly Focused Messages

The second implication is that the use of outwardly focused messages should be considered. The outwardly focused message had greater effectiveness than the inwardly focused message at lowering perceptions of risk, and through interaction effects, raising perceptions of benefits, creating positive attitudes toward the ad and increasing purchase intentions. The outwardly focused message also appeared to contribute indirectly to persuasion by increasing the involvement levels of other-oriented message recipients. Managers and message designers attempting to positively influence cognitions and purchase intentions may find that a message focused on promoting community or societal level benefits (and lowering perceptions of community/societal level risks), is more successful than one that focuses on individual level benefits and risks, particularly for other oriented consumers. Our results suggest that the other-oriented will be more involved with and more persuaded by an outwardly focused message.

7.3.2.3 Supplement Highly Credible Sources

The lack of effects found for the source credibility manipulation suggest that it is imprudent for managers and/or message designers to rely on a trustworthy or expert spokesperson or source for obtaining persuasion effects. Our results found only very limited persuasion effects for the high credibility source and then only when it was combined with other message manipulations. implications for message designers are that

persuasion effects are likely to be greater with an approach which includes a two sided, outwardly focused message than one which relies on high source credibility.

7.3.2.4 Measure Individual Traits

The final managerial implication relates to the measurement of individual traits, including initial attitudes, involvement, attitude toward technology, attitude toward nature, self-other orientation and alienation from the marketplace. These traits all influenced levels of persuasion whether measured by risk (initial attitude, attitude to technology, attitude to nature, self-other orientation), benefit perception,(initial attitude, attitude to nature, market place alienation), perceptions of source credibility (initial attitudes), attitude toward the ad (self-other orientation and market place alienation) or purchase intention (involvement, initial attitudes, self-other orientation). Given the influence that these traits have on the persuasion measures used it would seem prudent that they be measured both prior to the design of a message campaign and to assist in assessing the impact of such a campaign on targeted groups.

7.3.3 Limitations

A number of limitations to this research need discussion. Firstly, as this was an experimental research design the results are limited in their scope for generalization. However as the goal of experimental research is theory testing rather than generalizing findings to a population, the nature of the research project rather than this study's specific design causes this limitation. Nevertheless care must be taken to avoid extrapolating the

findings reported here to the population of New Zealand consumers, particularly where management implications are concerned.

The second limitation relates to the high attrition rate between those completing the first questionnaire and those subjects who completed the experiment in full. Only 77% of people who completed the first questionnaire went on to complete the full study. The most likely reason for this attrition rate relates to the fact that the study was conducted on-line, and participation was reliant on acceptably fast download speeds. On average the study took about 20 minutes with a broadband internet connection, but could take significantly longer with slower dial up modems. The study design aimed to minimise the time it took by ensuring that file sizes were kept small (none of the advertising appeal file sizes were bigger than 115kb) and participants were advised of the expected length of time it would take both in the letters sent out and on the first page of the web site. Nevertheless this high attrition rate may have introduced an element of non response bias into the results (see discussion below).

A third limitation relates to the fact that the appeals focused on promoting GMFs in general rather than specific products which may have affected the results for purchase intentions. Had the focus been on promoting a specific product, it is likely the purchase intention measure would have given more specific insights into consumer behaviour, and care must therefore be taken in extending these results to support the use of messages regarding specific GMF products and in extending them beyond intentions to actual behaviours.

A fourth limitation is directed towards the scales used. The measures for testing the message sidedness and inward vs. outward manipulation effects were developed specifically for this experiment as no appropriate scales could be sourced from the literature and the decision to compile these specific scales needs justifying. One and two-sided manipulation checks are by necessity context specific, as they involve ensuring that a disclaimer or negative element is successfully introduced into a message and therefore, as with all message sidedness studies, a manipulation check was designed specifically for this project. However, as the scale used was a one-item measure no reliability statistics are available.

Previous inward vs. outward message focus studies have used either gender specific scales, such as the Bem sex role inventory (Bem, 1974), or the personal attributes questionnaire (Spence, Helmreich and Stapp, 1975) neither of which are now thought to appropriately measure inner vs. outer directedness (see Hupfer, 2002). Alternatively, studies have taken a cross-cultural approach in which individualism vs. collectivism have been measured (Triandis, 1995). The cross-cultural questionnaire items introduce culturally specific elements and contextually these did not provide a good fit to the subject matter. For this reason a specific scale was designed for this study and as reported in the manipulation checks, the reduced five item scale was uni-dimensional, explained a satisfactory level of variance, (52%, see Diekhoff, 1992) and had satisfactory reliability ($\alpha = >0.76$). It was therefore considered that the scale acted in a stable manner.

Of further concern regarding the scales used were the covariates attitude to technology, marketplace alienation, self-other orientation (relationship) and reported cognitive elaboration, all of which had reliability levels below the accepted threshold of Cronbach's alpha (α) above 0.70. These scales were taken from the literature, and acceptable reliability ratings were found in recent studies for all four. The attitude to technology and marketplace alienation scales were reported in Bredahl (2001), with reliability of $\alpha \geq 0.75$ for attitude to technology, and between $\alpha = 0.68$ and 0.72 for marketplace alienation. The two item reported cognitive elaboration scale was taken from Bohner, Einwiller Erb and Siebler (2003) with reliability reported as $\alpha = 0.75$. Finally, the measure self-other (relationship) had reported reliability of $\alpha = 0.71$ in Wang, Bristol, Mowen and Chakraborty (2000). Despite these previously satisfactory results, the low levels of reliability reported in this study may suggest that these scales acted in an unstable manner representing a limitation to the study's findings.

A final limitation applying to this study relates to the existence of common method biases, self generated validity, as well as the possibility of negativity bias and non response bias. Common method bias refers to the presence of variance that is attributable to the measurement method rather than the construct of interest. This variance can have a serious confounding influence on empirical results, yielding potentially misleading conclusions (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Sources of common methods variance include social desirability bias, measurement context, or item context for predictor and criterion variables, from characteristics of the items themselves. In the case of experimental research, Podsakoff et al (2003) suggest that because researchers

manipulate an independent variable and obtain measures of mediators and dependent variables at the same time this can lead to method biases contributing to the observed relationship between the mediating and the dependent measure. Additionally, issues surrounding self generated validity or order effects also arise in experimental research, with concerns surrounding the way in which earlier responses to questions influence later responses. Specific concerns with this research also include questions relating to non response bias and negativity bias. Appropriate research design helps to mitigate some of these effects and in this case it was determined that issues relating to non response and negativity effects would all be spread across the conditions as the design did not differ. Measurement context and item effects were controlled through the use of published scales (with the exception of that used for self-other orientation) to ensure that these item effects would be minimised and once again if they did exist, their effects would be spread across all eight conditions. In the case of the other method biases, social desirability effects, order effects and questions of self generated validity, these were not controlled for and do represent a limitation of the study.

7.3.4 Future Directions

The results suggest a number of avenues for future research in both furthering understanding of the theoretical findings and in extending knowledge of persuasion effects in the context of information regarding GMFs. This section deals with theoretical issues first.

Firstly, further work needs to be undertaken to investigate the role of inward vs. outward message focus in information processing, particularly when combined with the additional manipulations of message sidedness and source credibility. The means by which the positive persuasion effects for the outwardly focused message came about need clarification. It is important to determine whether the effects seen here are related to the context used or whether outwardly focused messages are generally more persuasive than inwardly focused messages, particularly when combined with two sidedness and high source credibility. At this stage the contextual explanation appears to give the best fit, but this cannot be confirmed without further research. Investigating this relationship will enhance theoretical knowledge of inward vs. outward message focus, and if the interaction results with two-sided messages and highly credible sources leading to higher purchase intentions (albeit with a reduced scale) could be replicated outside of this context, a valuable contribution to our knowledge would be made.

Similarly, the manner in which the individual difference variable self vs. other-orientation influences information processing and persuasion effects also needs further investigation. These results suggest that an other-orientation acted to increase involvement in the subject matter, which contributed to a greater number of positive and lower negative comments about the appeal along with more powerful persuasion effects. Whether this can be replicated in contexts outside the one used here, such as in consumer behaviour studies dealing with products carrying individual risks and offering individual benefits is an interesting question that deserves further testing.

In terms of expanding on knowledge about the context, one obvious area for new research would involve re-running the study with a new source credibility manipulation. This would assist in determining whether the lack of main effect was the result of the manipulation itself, whether the influence of initial attitudes was too strong as per the suggestion of Frewer, Scholderer and Bredahl (2003), or whether in this context source credibility effects can only emerge when combined with other message factors. Understanding this is important, because there is likely to be reliance on a credible source in any real life communication strategy about GMFs and therefore understanding the limitations of the role of a highly credible source will be important in assessing how effective that strategy is likely to be.

One further suggestion for future research is to use specific GMF products rather than a general message. In this study, it was felt that a general message promoting GMFs would be viewed as more realistic than one promoting a specific product. However, two costs of using this approach arise, the opportunity of gaining insight into consumer attitudes towards purchasing specific products is lost and so is the opportunity to test Pechmann's (1992) correlational inference approach within a two sided message. An appeal promoting a specific GMF product would allow for both.

Ongoing research should also uncover further message factors that may be valuable in influencing persuasion effects. For example, comparing positive and negative message framing is one area that may be investigated for influence on benefit and risk perception. Further, Wansink and Kim (2001) proposed the use of reliable statistics and clear

evaluation criteria for central route processors. Research into how these may influence persuasion could be useful.

Finally, areas of future research were also suggested by the focus group results. The discussion on labelling issues raised questions surrounding consumer preferences for the labelling practices of GMFs, how these differ from current practices and industry standards, the extent of promotion required for awareness of labelling laws to emerge, and the effectiveness of GM food labelling in terms of creating a population of informed consumers. In terms of environmental and economic issues, the results suggest that further inquiry into whether awareness of potentially beneficial effects of GM technologies, such as producing high yields (Frewer, 1999) and minimizing the use of phosphate fertilizers in pastoral farming could be increased. Finally, finding ways of mitigating the sense of risk to the environment, to human health and to animal welfare are also important areas requiring future study. Researchers working in fields such as the public understanding of science and risk assessment, have outlined how public perceptions of the risk associated with new technologies differs markedly from those of experts (for example, Hornig, 1993). Finding ways to bridge these gaps and overcome risk perceptions is an important step in gaining acceptance of new technologies such as those used in the production of GMFs.

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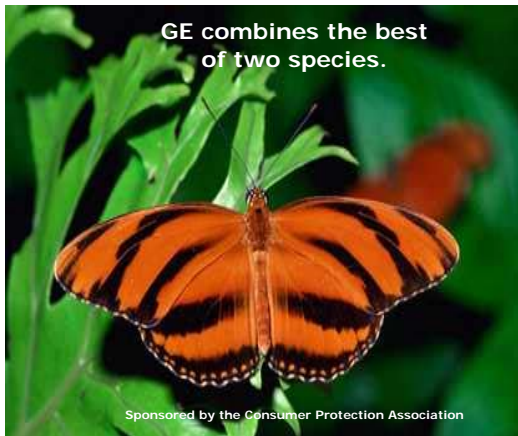
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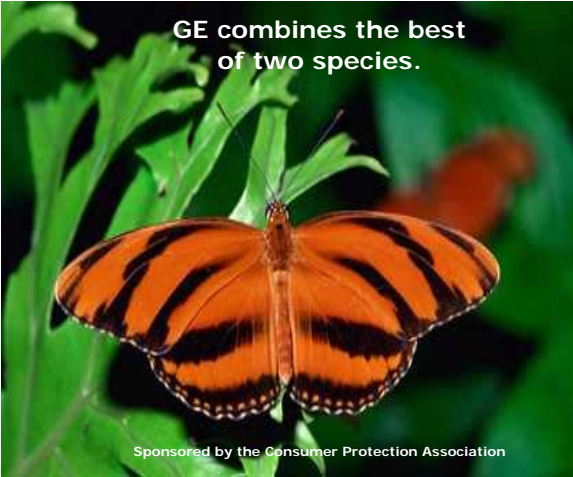
APPENDIX ONE

STIMULUS MATERIAL

CONDITION ONE
TWO-SIDED, OUTWARD FOCUSED, HIGHLY CREDIBLE.



CONDITION TWO
ONE-SIDED, OUTWARD FOCUSED, HIGHLY CREDIBLE.

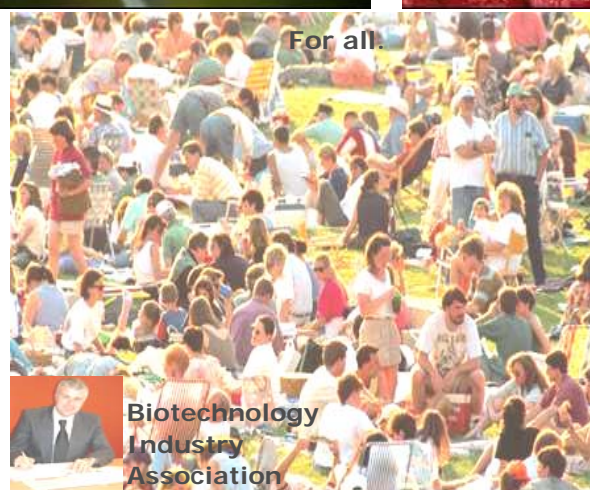
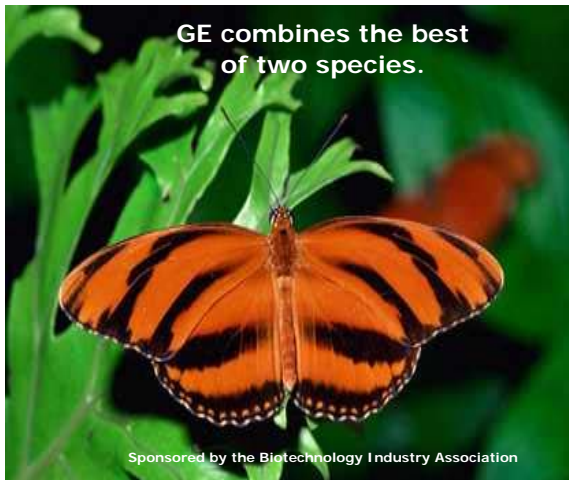


CONDITION THREE
ONE-SIDED, OUTWARD FOCUS, LOW CREDIBILITY.

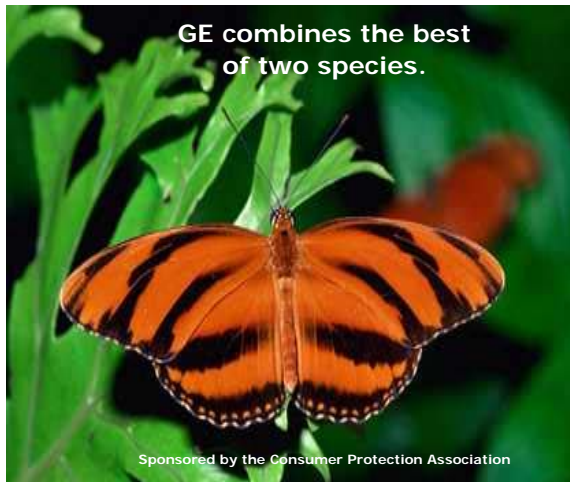


CONDITION FOUR

TWO-SIDED, OUTWARD FOCUS, LOW CREDIBILITY.



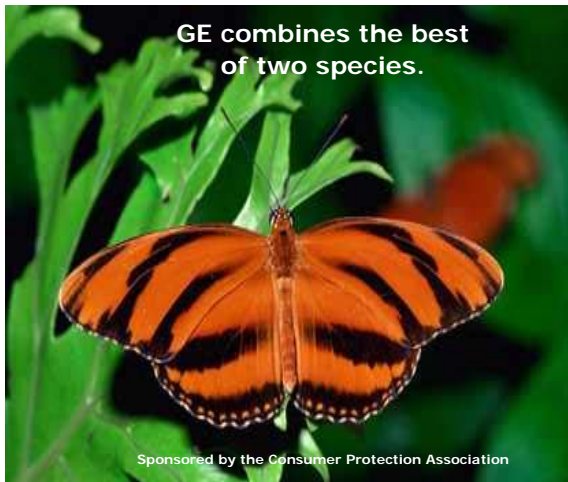
CONDITION FIVE
ONE-SIDED, INWARD FOCUS, HIGH CREDIBILITY.



CONDITION SIX
ONE-SIDED, INWARD FOCUS, LOW CREDIBILITY.

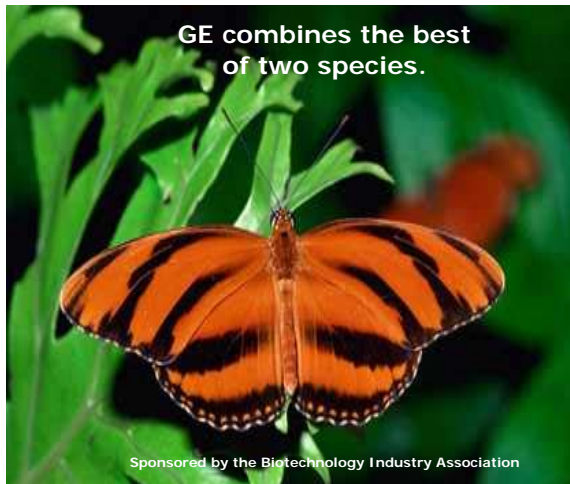


CONDITION SEVEN
TWO-SIDED, INWARD FOCUS, HIGH CREDIBILITY.



CONDITION EIGHT

TWO-SIDED, INWARD FOCUS, LOW CREDIBILITY



APPENDIX TWO

PRE-TEST QUESTIONNAIRE

Pre-test questionnaire:

Hi there and thanks for taking part in the pre-test. Please read through the introductions before answering any of the questions. Please make sure you have save this document before answering any of the questions and emailing it back.

Introduction to question one and two.

1. Suppose you were to see an advertising message for a food product such as milk or bread endorsed by the following organisation;



**Consumer
Protection
Association**

On a scale of 1-9, rate how credible you would consider that endorsement to be;

Extremely non-credible

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Extremely credible

**Enter your rating
here**

2. Suppose you were to see an advertising message for a food product such as milk or bread endorsed by the following organisation;



**Biotechnology
Industry
Association**

On a scale of 1-9, rate how credible you would consider that endorsement to be;

Extremely non-credible

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Extremely credible

**Enter your rating
here**

3. Look at the picture below and then using the scales from 1-9 rate how suggestive it is of the words that follow;



Words

a. Communal

Not communal at all

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 Extremely communal

Enter your rating here (a)

b. Self Reliant

Completely self reliant

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 Not self reliant at all

Enter your rating here (b)

c. Autonomous

Completely Autonomous

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 Not Autonomous at all

Enter your rating here ©

d. Interdependent

Not Interdependent at all

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 Completely Interdependent

Enter your rating here (d)

e. Separate

Completely Separate

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 Not separate at all

Enter your rating here (e)

f. Individualist

Completely Individualist

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Not individualist at all

Enter your rating here (f)

g. Interpersonal relationships

Not suggestive of interpersonal relationship at all

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Extremely suggestive of interpersonal relationships

Enter your rating here (g)

h. Concern for Others

Not suggestive of concern for others at all

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Extremely suggestive of concern for others

Enter your rating here (h)

i. Concern for self

Extremely suggestive of concern for self

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Not suggestive of concern for self at all

Enter your rating here (i)

j. Independence

Extremely suggestive of independence

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Not suggestive of independence at all.

Enter your rating here (j)

4. Look at the picture below and then rate how suggestive it is of the words that follow;



Words

a. Communal

Not communal at all

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 Extremely communal

Enter your rating here (a)

b. Self Reliant

Completely self reliant

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 Not self reliant at all

Enter your rating here (b)

c. Autonomous

Completely Autonomous

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 Not Autonomous at all

Enter your rating here ©

d. Interdependent

Not Interdependent at all

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 Completely Interdependent

Enter your rating here (d)

e. Separate

Completely Separate

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 Not separate at all

Enter your rating here (e)

f. Individualist

Completely Individualist

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Not individualist at all

**Enter your rating
here (f)**

g. Interpersonal relationships

Not suggestive of interpersonal
relationship at all

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Extremely suggestive of
interpersonal relationships

**Enter your rating
here (g)**

h. Concern for Others

Not suggestive of concern for
others at all

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Extremely suggestive of
concern for others

**Enter your rating
here (h)**

i. Concern for self

Extremely suggestive of concern
for self

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Not suggestive of concern
for self at all

**Enter your rating
here (i)**

j. Independence

Extremely suggestive of
independence

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Not suggestive of
independence at all.

**Enter your rating
here (j)**

Introduction to questions five and six

In the following questions it is important that you do not worry about whether you agree or disagree with the statements or whether you think they are right or wrong. Just focus on how they are written, and whether they are phrased in a positive or negative manner.

- 5a. Please indicate how many arguments, statements or comments you can see phrased in a negative manner in the following sentences and how many arguments, comments or statements are phrased positively.

**GE combines the best of two species.
GE food. Better nutrition, pesticide free and safe.**

Type the number of negative statements

Type the number of positive statements

- 5b. Rate the extent to which you believe that the statements attempts to acknowledge that some people may have concerns about GE food.

Does not attempt to
acknowledge concerns
at all.

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Makes many attempts to
acknowledge peoples
concerns

**Enter your rating
here**

- 5c. Rate the extent to which the statements attempt to deal with the issues that some members of the public may have about GE food.

Does not attempt to deal with issues at all.

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Makes many attempts to deal with issues.

Enter your rating here

- 6a. Please indicate how many arguments, statements or comments you can see phrased in a negative manner in the following sentences and how many arguments, comments or statements are phrased positively.

**GE combines the best of two species.
Some people think that GE is playing Frankenstein with their food,
But nature has been mixing it up for centuries.
GE food. Better nutrition, pesticide free and safe.**

Type the number of negative statements

Type the number of positive statements

- 6b. Rate the extent to which you believe that the statements attempts to acknowledge that some people may have concerns about GE food.

Does not attempt to acknowledge concerns at all.

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Makes many attempts to acknowledge peoples concerns

Enter your rating here

- 6c. Rate the extent to which the statements attempt to deal with the issues that some members of the public may have about GE food.

Does not attempt to deal with issues at all.

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

Makes many attempts to deal with issues.

Enter your rating here

APPENDIX THREE

EXPERIMENTAL DESIGN



Te Whare Wānanga o Waitaha
UNIVERSITY OF CANTERBURY

Welcome to the Research site!

Welcome! and thanks very much for
taking the time to visit this page.

This site forms part of a research
project being conducted through the
University of Canterbury 's Web-l@b
research group.

We hope you decide to take part in the study and that you
enjoy the experience!



 [Click here to enter the study.](#)

What is the study?

 [Go back](#)

[Explanation](#)

[Where did we get
your details?](#)

[Confidentiality](#)

[You don't have to
take part.](#)

[Contact us](#)

[Results](#)

[Prize Draw](#)

[Get started.](#)

Explanation

The study involves collecting information on what people think about a variety of subjects. The issues we are looking at are called social issues because each of them is of importance to New Zealand society.



We'll explain a bit about each of the issues in the following pages, but firstly let me tell you why we chose to ask you about your opinions. We wanted a broad range of opinions, and so invitations to take part in the study were issued nationwide, to people of all ages and backgrounds. We're happy to have the opinions of experts, but we want the opinion of everyday people as well. Because this is a research project on specific issues, we have restricted the study to people over the age of eighteen. Should you decide to continue we ask that you complete it only once, that way we can make sure we get the broadest range of opinions possible.

Where did we get your details?



We did not buy your address details from anywhere, nor will we on-sell them. The information that we used to contact you was taken from publicly available sources (the electoral roll) and we will discard the details once the information has been collected.

Confidentiality.



The study including your questionnaire is totally anonymous, at no time will you be asked to give personally identifiable information, nor will we be able to identify you when we analyse the data.

The data will be available only to the research team involved in this study and all information gathered will be kept in a secure database.

We will record your email address separately for the sole purpose of notifying the winners of the prize draw. Once the winners have been notified, we will destroy our records of your email address.

You don't have to take part.



You do not have to take part in the study if you do not wish to, you can choose to leave the site at any time. By completing the study and submitting your final answers you are personally consenting to take part.

Contact us.

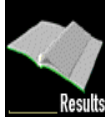


Should you have any concerns or questions regarding the study, you can email us using either of the following.

m.renton@mang.canterbury.ac.nz

david.fortin@canterbury.ac.nz

Results.



As we are not keeping your address we will not be able to send you a copy of the study's results. We will however publish a page detailing the main results on the weblab site.

Prize Draw.



We are pleased to offer all participants the chance to win one of ten mobile phone re-charge cards to the value of \$40 each, for either the telecom or vodafone networks. If you don't have a cell phone you can choose to take a telecom calling card to the value of \$40 instead.

Enough Already!

Okay, enough about the details. To get started click on the link below. The full study should take you about 20 minutes.

[Please click here to continue](#)



Let's get started!

To get you started we want to ask you a few questions about the issues that we are focusing on in this research. There are no right or wrong answers to the questions that ask about your opinions, so when answering, it's a good idea to go with your instinct rather than try and think too deeply about each one.



Please click the submit button to continue the study.

Submit

The Messages

Now that we have asked you the initial questions, the next step is for you to view a series of messages about issues that are of importance to New Zealand society. Once you have seen these we will explain a little about each of the issues before showing you the messages again. You will then be asked to answer a questionnaire about one of the messages.

To view these messages you need to have a flash player installed on your computer. This player comes automatically with Internet Explorer and Netscape, so if you are using either of these to view this website you probably already have the player. If you find you can't open the messages you can click on the macromedia link (below) to download a copy of the latest version of the flash player. The download is free and should not take too long.

www.macromedia.com/downloads

If you are using a dial up connection, each message should download within 20-30seconds (using a 56k modem), to keep the download time as low as possible the messages do not contain any audio.

When you're ready, click on the link below to view the first message.

 [Click here to view the first message.](#)

[Message one.swf](#)

-

Click on the link above to see the message.

When the message is completed a button will appear, to continue the study click on the button to go to the next message.

ADVERTISEMENT ONE, DRINK DRIVING APPEAL



Drinking?

Take a taxi.



[Message two.swf](#)

Click on the link above to see the message.

When the message is completed a button will appear, to continue the study click on the button to go to the next message.

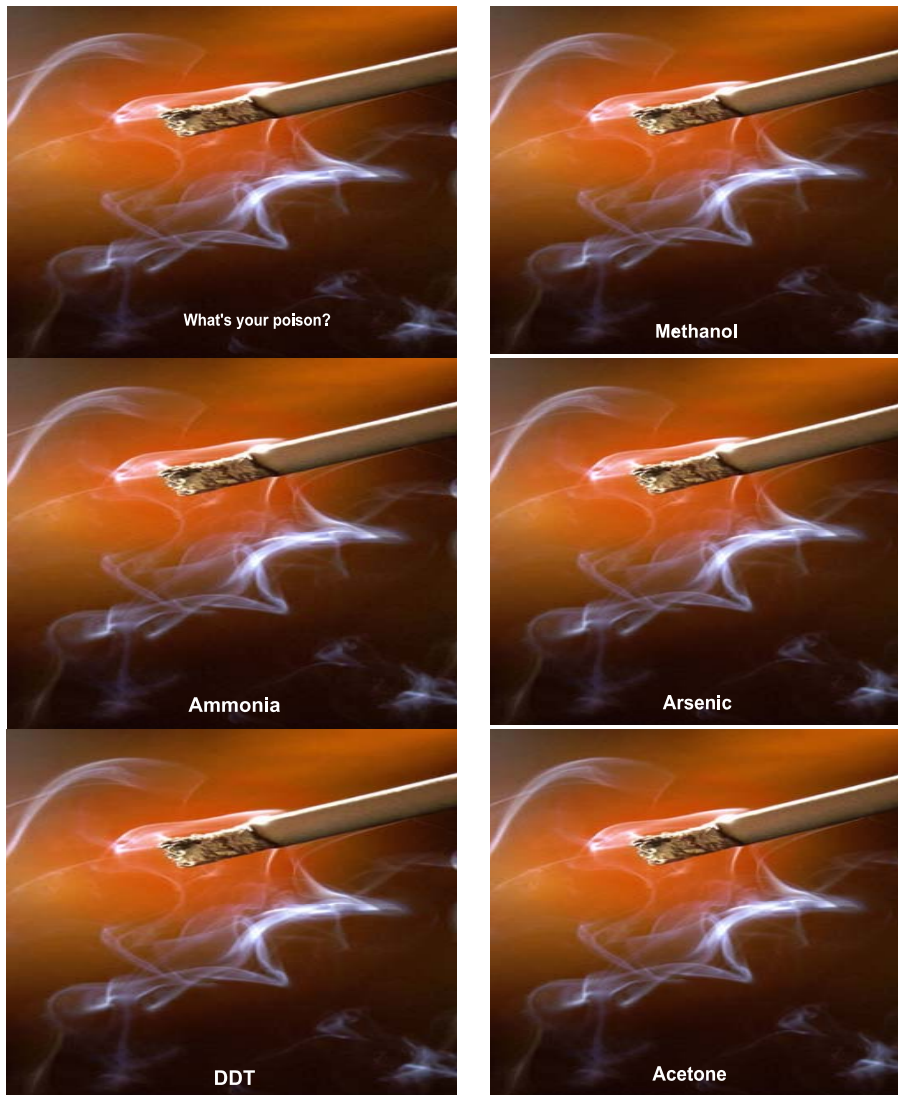
TARGET APPEAL
(REFER APPENDIX ONE)

[Message three.swf](#)

Click on the link above to see the message.

When the message is completed a button will appear, to continue the study click on the button to go to the next message.

ADVERTISEMENT THREE, ANTI-SMOKING CAMPAIGN



0800 340 340

**Quitting?
Call the
smoking;
Want to Quit**

[Message four.swf](#)

Click on the link above to see the message.

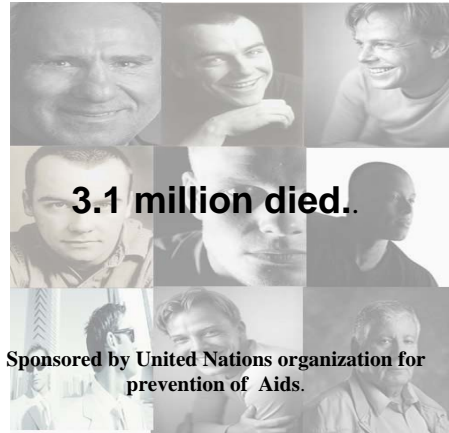
When the message is completed a button will appear, to continue the study click on the button to go to the next message.

ADVERTISEMENT FOUR, HIV AIDS PREVENTION



**In 2002 5 million
became infected
with HIV.**

Sponsored by United Nations organization for
prevention of Aids.



3.1 million died..

Sponsored by United Nations organization for
prevention of Aids.



**How well do you
know the people
you're involved
with?**

Sponsored by United Nations organization
for prevention of Aids.



**Well enough to
trust them with
your life?**

Sponsored by United Nations organization
for prevention of Aids.

**There's nothing
positive about Aids.**

**Protect yourself,
always use a
condom.**





About the Issues

To help you to answer the questionnaire, we have included a small amount of information about each of the issues for you to read before seeing the messages again.

Issue One. Drunk Driving.

The incidence of death and serious injury resulting from Drunk Driving remains significant in this country, even though most New Zealanders believe that driving while drunk is unacceptable. Strong support is shown by the public towards campaigns run by the NZ police and the Land Transport Safety Authority to reduce the incidence of driving while intoxicated.

Promotional campaigns are targeted primarily toward young males, although lately campaigns directed at females have also appeared. The campaigns use a combination of fear, shock and loss of social acceptance to put their message across.

Issue Two. The use of Genetic Engineering in food production.

Genetic Engineering (or Genetic Modification) is a scientific technology that has been developed for commercial use over the past few decades. While there are many uses for Genetic Engineering, its application to food products has received a large amount of publicity through the media. The process involves changing, inserting or deleting the DNA of an organism to alter the final expression of its genes.

So far most of the publicity about Genetic Engineering has been generated through news items about either new advances in the technologies, or opposition and protests about such advances. The publicity is targeted to the general public.

Issue Three. Smoking.

Tobacco smoking is the one of the most preventable causes of early death in New Zealand. Each cigarette contains over 4,000 harmful chemicals and over 4,500 New Zealanders die from smoking-related illnesses each year. As well as harming themselves, smokers put the health of others at risk through their exposure to the same harmful chemicals.

Anti-smoking promotional campaigns are targeted towards helping smokers find ways of quitting, ensuring teenagers and children do not start smoking, and in supporting government legislation such as smoke free workplaces, restaurants and bars.

Issue Four. Incidence of HIV infection

In 2003 the reported incidence of new HIV infection reached the highest levels that New Zealand has ever seen. While tremendous breakthroughs in drug treatment for HIV/Aids sufferers have been made, there is still no cure for Aids and the costs of this debilitating syndrome are enormously high for the sufferers, their families and for New Zealand society as a whole.

Promotional campaigns aimed at reducing the incidence of HIV/Aids, are targeted towards groups considered highly at risk of becoming infected with HIV. These include gay males, IV drug users and those engaged in unprotected sexual intercourse.

Now that you have read through the information, click on the link below to continue.

 [Click here to continue](#)

Messages one, two, three and four were repeated, with the target appeal shown a total of three times. Following which the study linked to the main questionnaire (refer appendix four).

APPENDIX FOUR

QUESTIONNAIRES

INITIAL QUESTIONNAIRE

Question one:

- A. Do you smoke?
- B. Have you, or anyone you are personally close to been affected by any of the following:
(you can indicate as many of these as you wish).
- ☐ minor smoking related conditions (e.g. smokers cough)
 - ☐ more serious smoking related conditions (e.g. smoking related asthma)
 - ☐ serious smoking related disorders (e.g. lung disease including emphysema, cancers)
 - ☐ none of these.
- C. On the following 5 point scale, indicate where your views on smoke free pubs, bars and restaurants best fits.

Totally opposed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Totally supportive
-----------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------

Question two:

- A. Do you drink alcohol?
- B. In the last 5 years have you been convicted of a drinking related driving offence?

- C. On the following 5 point scale indicate how good a job you think the Police do to stop drunk driving?

Extremely bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely good
---------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	----------------

Question three:

Please indicate on the following 5 point scale your opinion on the following questions;

- A. Applying gene technology in food production is;

Extremely bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely good
Extremely foolish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Extremely wise

- B. When it comes to applying gene technology to food, I would describe myself as

Strongly Against	<input type="button" value="v"/>
------------------	----------------------------------

Question four:

- A. In terms of risk of infection with the HIV virus I would describe myself as

Low risk	<input type="button" value="v"/>
----------	----------------------------------

Please click the submit button to continue the study.

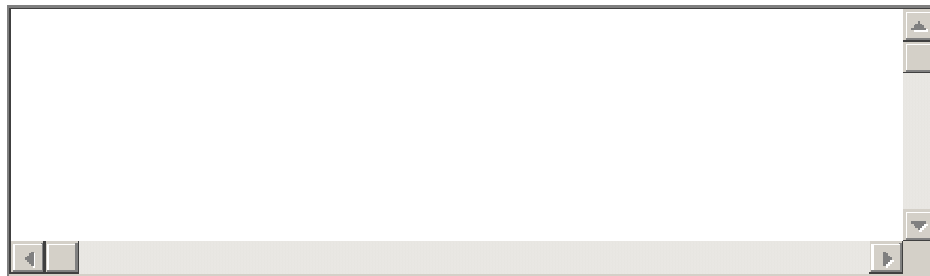
Submit

MAIN QUESTIONNAIRE

The following are questions about what message that you have just seen. ***The questions refer only to the advertisement that you have been shown a total of three times.*** Once again, there are no right or wrong answers to the questions that ask about your opinions and we suggest that you go with your instinct rather than think too deeply about each one.

Section One.

1. In the next two minutes, please write down all the thoughts you had about the advertisement. At the end of two minutes please move on to the next question. If you finish recording your thoughts before the two minutes are over, please move on to question two.



2. When looking through the advertisements on the website, how intensely did you examine the advertisement for genetically engineered food?

Not intensely at all								Very intensely
----------------------	--	--	--	--	--	--	--	----------------

3. On the seven point scale below indicate how carefully you read the text of the advertisement for Genetically Engineered food?

Not carefully at all								Very carefully
----------------------	--	--	--	--	--	--	--	----------------

4. The following question relates to the message source, that is, the organisation that sponsored the ad.

The message source was;

Insincere	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sincere
Dependable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Not Dependable
Trustworthy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Not trustworthy
Not credible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Credible

5. Rate the extent to which you agree or disagree with the following statements;

- a. The advertisement attempts to acknowledge that some people may have concerns about Genetically Engineered food.

Strongly Disagree	<input type="radio"/>
-------------------	-----------------------

- b. The advertisement attempts to deal with the issues that some members of the public may have about Genetically Engineered food.

Strongly Disagree	<input type="radio"/>
-------------------	-----------------------

6. On the five point scale below, please rate the extent to which the advertisement makes you think about;

- a. Yourself or your community.

Yourself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Your community
----------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	----------------

- b. The food you eat or the food others eat.

The food you eat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	The food others eat
------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	---------------------

- c. How Genetically Engineered food affects you personally, or how Genetically Engineered food affects you and others around you.

You personally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	You and others around you.
----------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	----------------------------

7. Please rate the extent to which you agree or disagree with the following;

I think of myself as a consumer likely to purchase Genetically Engineered food.

Strongly Disagree	<input type="button" value="▼"/>
-------------------	----------------------------------

8. The ad was;

Good	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bad
Liked	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Disliked
Interesting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Uninteresting
Irritating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not irritating

You are now 25% through the questionnaire!

[Click here to continue](#)

Section Two

9. Rate your level of agreement or disagreement with the following;

- a. A person should be independent from others, even with his or her friends or family members.

Strongly Disagree	<input type="button" value="▼"/>
-------------------	----------------------------------

- b. Keeping my autonomy and independence is most important in my relationships

Strongly Disagree

- c. I like to solve my personal problems myself, even if someone else could help me.

Strongly Disagree

- d. I prefer to make my own decisions most of the time.

Strongly Disagree

10. Rate your level of agreement or disagreement with the following;

- a. When I describe myself, I also mention those who are important to me as if they were part of myself

Strongly Disagree

- b. I consider those people who are closely related to me as part of myself

Strongly Disagree

- c. Among my most intimate family members and close friends, we share our personal experiences.

Strongly Disagree

- d. I find that I easily experience other people's feelings as my own feelings.

Strongly Disagree

- e. A good relationship consists of people who enjoy being together

Strongly Disagree

- f. I make most of my personal decisions jointly with other family members or close friends.

Strongly Disagree

11. Rate your level of agreement or disagreement with the following;

- a. A mature person should use important social norms as a guide to his or her behaviour.

- b. My personal achievement resides in my contribution to society.

- c. My personal achievement would not be possible without a supportive relationship with other people.

- d. How I define myself is influenced by my relationship with my reference groups.

12. I think the use of Genetic Engineering in food production is;

important	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	unimportant
of no concern to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	of concern to me
valuable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	worthless
beneficial	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	not beneficial
essential	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	nonessential
undesirable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	desirable
not needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	needed

13. Indicate how much you agree or disagree with the following statements;


- a. I am reluctant about adopting new ways of doing things until I see them working for people around me.

Strongly Disagree 


- b. I rarely trust new ideas until I can see whether the vast majority of people around me accept them.

Strongly Disagree 


- c. I am aware that I am usually one of the last people in my group to accept something new.

Strongly Disagree 

- d. I must see other people using innovations before I will consider them.

Strongly Disagree 

- e. I am generally cautious about accepting new ideas.


Strongly Disagree 

- f. I tend to feel the old way of living and doing things is the best way.

Strongly Disagree 

14. Rate your level of agreement or disagreement with the following;

- a. My life is determined by my own actions.

Strongly Disagree 


- b. I am usually able to protect my personal interests.

Strongly Disagree 

- c. I can pretty much determine what can happen in my own life.

Strongly Disagree 

- d. To a great extent, my life is controlled by accidental happenings.

Strongly Disagree 

- e. Often there is no chance of protecting my personal interest from bad luck happenings.

Strongly Disagree 

- f. When I get what I want, it's usually because I'm lucky.
- g. People like myself have very little chance of protecting our personal interests where they conflict with those of strong pressure groups.
- h. My life is chiefly controlled by powerful others.
- i. I feel that what happens in my life is mostly determined by powerful others.

You are now 50% through the questionnaire!

[Click here to continue](#)

Section Three

15. Rate the extent to which you agree or disagree with the following;

- a. The degree of civilization of a people can be measured from the degree of its technological advancement.
- b. New technological inventions and applications make up the driving force of the progress of society.
- c. In New Zealand, we are probably better off than ever thanks to the tremendous progress in technology.
- d. Throughout the ages, technological know how has been the most important weapon in the struggle for life.

- e. Because of the development of technology we will be able to face up to the problems of tomorrow's society.

Strongly Disagree



16. Rate the extent to which you agree or disagree with the following;

- a. The balance of nature is very delicate and easily upset by human activities

Strongly Disagree



- b. The earth is like a spaceship with only limited resources.

Strongly Disagree



- c. Plants and animals do not exist primarily to be used by humans

Strongly Disagree



- d. Modifying the environment for human use seldom causes serious problems.

Strongly Disagree



- e. There are no limits to growth for countries like New Zealand.

Strongly Disagree



- f. Mankind was created to rule over the rest of nature

Strongly Disagree



17. Rate the extent to which you agree or disagree with the following;

- a. I am constantly sampling new and different foods.

Strongly Disagree



- b. I don't trust new foods.

Strongly Disagree



- c. If I don't know what a food is I won't try it.


Strongly Disagree








- d. I am afraid to eat things I have never had before.

Strongly Disagree







- e. I will eat almost anything.
- Strongly Disagree 

18. Rate the extent to which you agree or disagree with the following;

- a. Most companies are responsive to the demands of the consumer.
- Strongly Disagree 
- b. Unethical practices are widespread throughout business.
- Strongly Disagree 
- c. Stores do not care why people buy their products just as long as they make a profit.
- Strongly Disagree 
- d. Harmful characteristics of a product are often kept from the consumer.
- Strongly Disagree 
- e. Most claims of product quality are true.
- Strongly Disagree 

19. Rate the extent to which you agree or disagree with the following;

- a. I personally am very knowledgeable about the use of gene technology in food production.
- Strongly Disagree 
- b. The average person in this country is very knowledgeable about the use of gene technology in food production.
- Strongly Disagree 
- c. Science is very knowledgeable about the use of gene technology in food production.
- Strongly Disagree 
- d. The Government is very knowledgeable about the use of gene technology in food production.
- Strongly Disagree 

- e. Industry is very knowledgeable about the use of gene technology in food production.

Strongly Disagree 


f.

You are now 75% through the questionnaire [Click here to continue](#)


Section Four

20. Please rate the extent to which you agree or disagree with the following;


- a. Genetically modified food products will improve the standard of living of the future generations.

Strongly Disagree 


- b. Genetically modified food products will increase my own and my family's standard of living.

Strongly Disagree 


- c. Genetically engineered food products are healthier than other food products.

Strongly Disagree 


- d. Genetically engineered food products are better quality food stuffs than other food products.

Strongly Disagree 


- e. Applying gene technology in food production will increase the product choice in supermarkets.

Strongly Disagree 


- f. Applying gene technology in food production can be used to solve environmental problems.

Strongly Disagree 

- g. Applying gene technology in food production will reduce the price of food products.


Strongly Disagree 

- h. Applying gene technology in food production is a necessary activity.


Strongly Disagree 

21. Please rate the extent to which you agree or disagree with the following;


- a. Genetically engineered food products will cause allergy in human beings.

Strongly Disagree 


- b. Genetically engineered food products are a threat to human health.

Strongly Disagree 


- c. Applying gene technology in food production will cause environmental hazards.

Strongly Disagree 


- d. Genetically engineered organisms are likely to interfere with wild species in nature.

Strongly Disagree 


- e. Nobody knows the long term consequences on the environment and human health of applying gene technology in food production.

Strongly Disagree 

- f. Applying gene technology in food production will only benefit the producer.

Strongly Disagree 

- g. Applying gene technology in food production is unnatural.

Strongly Disagree 

h.

22. If Genetically Engineered foods were available in the shops, I would intend to

Definitely avoid them								Definitely buy them
-----------------------	---	---	---	---	---	---	--	---------------------

23. The idea of purchasing Genetically Engineered food is ;

Extremely								Extremely good
-----------	---	---	---	---	---	---	---	----------------

bad								
Extremely pleasant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Extremely unpleasant

24. With regards to buying Genetically Engineered food I would describe myself as;

Strongly for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Strongly against
--------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	------------------

25. You are?

26. Your age is?

27. Your highest level of education is?

28. You live where? (give the city or town where you live, or the one closest to you.)

29. Your family income bracket is?

30. Please enter your email address here, so that we can enter you into the prize draw.

Please click the submit button to finish.

Final Submit